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Original Communications

THE TOXIC ACTION OF DIGITALIS ON THE HEART MUSCLE.*

By WM. B. PORTER, M. D., Roanoke, Va.

As early as 1785, William Withering set the dictum that digitalis should be continued in moderate doses until it acts on either the kidneys, the stomach, the pulse or the bowels; let it be stopped upon the first appearance of one of these effects. For some years this dictum has been relegated to the scrap heap and replaced by the teaching of some of our foremost clinicians, that the real danger in digitalis therapy is in insufficient dosage.

This emphasis has prompted a heedless attitude toward the toxicology of foxglove and a blind administration of it without due regard for its potential dangers. Today this practice is fraught with real hazard, for the pharmaceutical manufacturer is now supplying the profession with potent preparations capable of producing all of the pharmacological actions of this drug. It would seem wise, therefore, to review the toxic action of digitalis on the heart muscle in the light of recent knowledge of the mechanism of the heart beat, and see how accurately the experimental and clinical facts coincide.

From experimental pharmacology we know that when a frog's heart is poisoned with digitalis, the initial changes are followed by coupling, pulsus bigeminus, and, later, by a very rapid and irregular heart action; delirium cordis sets in and death intervenes.

Cushny believes that the explanation of the fast and irregular action of the heart poisoned with digitalis is to be found in the increased irritability of the cardiac muscle.

Robinson and Wilson, in studying the progress of events that occur when the heart of a cat is progressively poisoned by digitalis, found certain phenomena made their appearance after definite percentages of the lethal dose have been given. This sequence of events, which represents increasing degrees of effect and toxicity, they found to be as follows: First, inversion of the T-wave of the electrocardiogram occurred. After additional amounts of the drug were administered, depression of the atrio-ventricular conduction made its appearance. At about this time, there was slowing of the heart rate which came on gradually. After still larger amounts, there was an increase in rhythmicity of the auricles and of the ventricles, producing acceleration of both. The ventricular rate soon exceeded that of the auricle, thus producing atrio-ventricular disassociation. At about this stage idio-ventricular complexes made their appearance. Independent ventricular rhythm with abnormal ventricular complexes developed. This was soon followed by ventricular fibrillation and death.

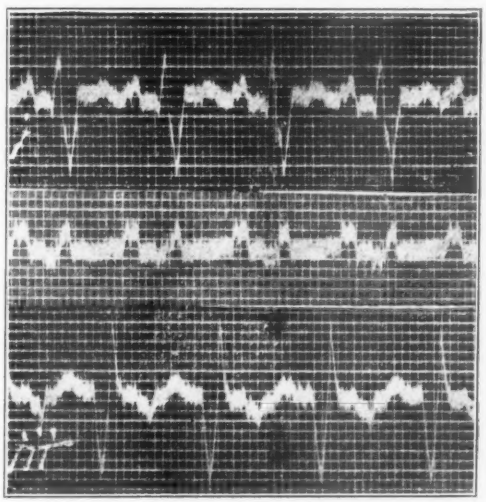

Figure 1.—Taken before the administration of digitalis. No disturbance of rhythm is noted.

Reid has recently reported five cases of ventricular ectopic tachycardia complicating digitalis therapy. In one of the cases there was a transition from ventricular tachycardia into ventricular fibrillation with immediate death.

*Read before the fifty-sixth annual meeting of the Medical Society of Virginia, at Richmond, October 13-16, 1925.

He noted that in each instance the amount of digitalis administered before the onset of this rhythm was well in excess of that indicated by the Eggleston method of dose calculation. In some of the patients the condition was confused with auricular flutter and more digitalis given.

Luten, in his clinical studies on digitalis, has reported a very interesting series of cases who developed toxic rhythms while under digitalis therapy. The similarity between such rhythms in men and in the cat is especially striking. He emphasizes this fact and calls attention to the possible transition into ventricular fibrillation.

Robinson and Hermann have emphasized the relationship of coronary occlusion and paroxysmal ventricular tachycardia. This relationship has been proven in animals and probably exists in many instances in man. These observers do not mention digitalis as a probable related factor in their cases, though it is probable from the type of cases studied that digitalis was administered.

It is well established that the intravenous administration of digitalis or some of its allies to patients under the influence of digitalis is dangerous and is frequently followed by sudden death. Various explanations have been given for this untoward result. The writer recalls such an instance in his own experience and others have been impressed with this danger.

During the past few years I have observed five patients who had cardiac evidence of digitalis over-dosage. In three of these I have been able to obtain electrocardiograms. The disturbance of rhythm observed in these patients so closely parallels that observed in animals poisoned with digitalis that the significance is of especial clinical importance. In two instances there was observed an undoubted idio-ventricular rhythm having the characteristics of an ectopic ventricular tachycardia. It should be noted that in experimental pharmacology this occurs just prior to ventricular fibrillation and death. The third case is one of peculiar interest in that there is a transition from normal QRS complexes into a typical levio-cardiogram, indicating right bundle branch block. This appeared in paroxysms and disappeared after the withdrawal of digitalis, with evident improvement in the patient's clinical condition.

Case Reports.†

Case I. A white male, aged forty-six years, was admitted to the medical service of the Lewis-Gale Hospital, December 22, 1922.

The present illness began two months previously with a severe attack of angina pectoris, lasting eight hours, which required large doses of morphine for partial relief. Following this primary illness, cardiac insufficiency had been progressive with the development of marked venous stasis and edema.

The diagnosis on admission was myocardial infarction secondary to coronary thrombosis, congestive heart failure, anasarca. Pulse rate, 98 per minute. Electrocardiogram, Figure 1, showed ventricular complexes of a distinctly abnormal type. There is a slight widening of the QRS complexes, iso-electric T-wave in lead 2, notching of the P in leads 1 and 2.

The patient was begun on a restricted dry diet with restriction of the fluid intake of 800 c.c. for twenty-four hours. Powdered digitalis was administered in divided doses, the amount having been calculated by the Eggleston formula for basal dose requirements. After the administration of approximately 60 per cent of the calculated amount of digitalis, extrasystoles appeared, disturbing the cardiac rhythm. The digitalis was discontinued but there developed in the course of the next twelve hours paroxysmal palpitation with a very rapid ventricular rate. The electrocardiograms, Figure 2, showed ventricular paroxysmal tachycardia. An independent auricular activity is easily recognizable in leads 1 and 2, rate 120, ventricular rate 204. This disturbed rhythm recurred whenever the digitalis was re-administered.

Case II. A white male physician, aged forty-six years, was admitted to the medical service of the Lewis-Gale Hospital, October 25, 1925. The presenting symptoms were dyspnea, palpitation and sub-sternal pain with slight exertion.

The clinical diagnosis was chronic nephritis, azotemic type, hypertension (blood pressure—systolic 210, diastolic 145), marked cardiac hypertrophy, congestive heart failure, and auricular fibrillation.

The patient was begun on a diet with protein restricted to forty grams with a total caloric value of 2,000. Digitalis was administered

†Previously reported in Amer. Jour. Medical Sciences, June, 1924, Vol. CLXVII. p. 821.

in graduated amounts. The pulse was lowered from 107 to 58 per minute with the development of freqeunt extrasystoles after the administration of an amount well below the calculated basal requirements. The digitalis was discontinued but there developed paroxysmal dyspnea with a rapid regular ventricular rhythm.

Electrocardiogram, Figure 3, showed a transition of the cardiac mechanism into a ventricular tachycardia, the stimuli originating alternatingly from the right and left ventricle, then entirely in the left ventricle. The tachycardia passed off gradually into a pulsus bigeminus, similar to that observed preceding the tachycardia. The paroxysms recurred frequently, lasting from six to twenty-five minutes, but they ceased to occur after an interval of forty-eight hours, presumably as the result of the detoxication of the myocardium by excretory processes.

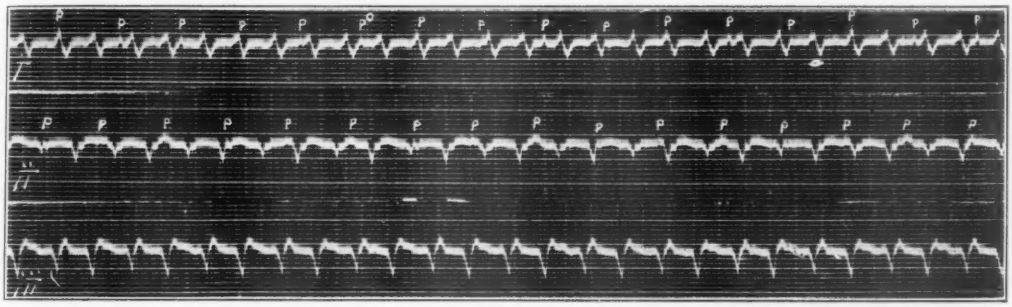

Figure 2.—Taken during a paroxysm of palpitation. Ventricular paroxysmal tachycardia. Auricular rate, 120, ventricular, 204.

Case III. A white male, aged sixty-four, was seen in the out-patient department of the Lewis-Gale Hospital, September 23, 1924. He was complaining of dyspnea, cough and upper abdominal soreness.

The diagnosis was cardio-vascluar sclerosis, cardiac hypertrophy, auricular fibrillation and congestive heart failure. Blood pressure—systolic 185, diastolic 85.

The basal dose of digitalis was prescribed and he was instructed to discontinue the drug when this amount had been taken. The improvement in the subjective symptoms was so great that he continued the use of the digitalis until he returned ten days afterwards. At that time the dyspnea had returned after an interval of relief and there was great physical weakness and prostration. The pulse was forty-eight per minute and the blood pressure was systolic 98, diastolic 76. The electrocardiogram, Figure 3, showed a complete heart block, auricular fibrillation, and a gradual transition of the QRS complexes into a form characteristic of right bundle branch block.

The digitalis was discontinued and after a period of six days the subjective symptoms were relieved, the blood pressure was systolic 155, diastolic 80, and the electrocardiograms had returned to their previous characteristics.

Discussion

In Case I there were clear indications for digitalis therapy. This patient was suffering from congestive heart failure with oedema induced by a coronary thrombosis. The administration of digitalis in amounts well below the calculated basal dose produced a marked increase in ventricular irritability with consequent and frequent ventricular extrasystoles, passing into ventricular ectopic tachycardia. It is highly probable that the ventricular musculature was hyper-susceptible to digitalis as the result of the myocardial infarction. This observation was frequently confirmed with a recurrence of a similar toxic rhythm.

In Case II, a ventricular rate of 58 was induced by digitalis. The rate prior to digitalis therapy was 104. The dose used was well below the computed basal dosage, yet this patient developed paroxysmal idio-ventricular complexes with a rate of production of 168, which recurred in paroxysms at frequent intervals. The confusion of this ventricular ectopic tachycardia with auricular flutter would not be unreasonable from a clinical analysis. It is conceivable, however, that this confusion with further administration of digitalis, especially intravenously, would have been instantly fatal as a result of inception of a ventricular fibrillation.

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In Case III, there is an entirely different toxic reaction to digitalis. In this instance, complete auriculo-ventricular dissociation occurred in a patient with auricular fibrillation. At frequent intervals there is a transition of the QRS complexes into the characteristics of a right bundle branch block with a regular rhythm of 48. With the occurrence of this mechanism there was a decided increase in the clinical signs of cardiac insufficiency, a fall in the systolic blood pressure, an increase in the venous stasis with marked asthenia and dyspnea. These symptoms occurred with a digitalic dosage well in excess of the calculated basal requirements.

It is of especial clinical note that in none of the patients here studied were there any of the usual symptoms of digitalis intoxication, such as nausea, vomiting and diarrhea.

Conclusions

1. The evidence presented in these cases and in those reported by other observers points to

Figure 3.—Taken during an attack of palpitation. Ventricular paroxysmal tachycardia. Ventricular rate, 168. Note alternation from right to left ventricle in lead 2, second strip.

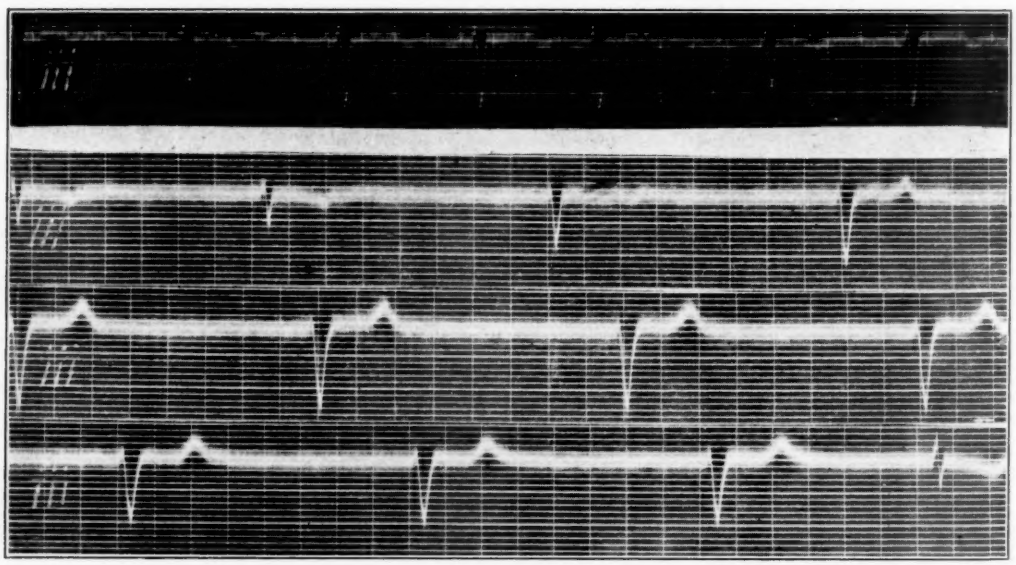

Figure 4.—Top strip shows rate and ventricular complexes, lead 3, before digitalis. The other three strips, lead 3, after digitalis. Complete auriculo-ventricular dissociation. A gradual transition into a levo-cardiogram, indicating intraventricular block.

a close parallelism between toxic rhythms induced in animals and those occurring in man when the myocardium is intoxicated with digitalis.

2. The occurrence of a paroxysmal rapid rhythm in a patient who is digitalized is a positive indication for the discontinuance of the drug. Intravenous administration of digitalis or its allies under such circumstances is very liable to produce sudden death.

3. Serious toxic rhythms do occur in patients with advanced myocardial disease when the dose of digitalis is well below the calculated basal requirements and in the absence of the usual accepted symptoms of digitalis intoxication.

4. The mechanism of sudden death in man from digitalis is probably in many instances a transition from ventricular ectopic tachycardia to ventricular fibrillation.

TREATMENT OF BREAST TUMORS.*

By JULIAN L. RAWLS, M. D., Norfolk, Va.

It is impossible to consider the treatment of breast tumors without taking up the question of diagnosis, because rational treatment depends absolutely upon an accurate recognition of the pathology present.

To take up individually the various varieties of tumors of the breast would not profit us much. Suffice it to say that there are listed some ten or twelve benign tumors and about fifteen varieties of malignant tumors. For the sake of brevity I wish to divide these growths into four varieties: First, those that are frankly benign and would probably remain benign over a long period of time; second, those that are probably benign but potentially malignant; third, those that are probably malignant but operable; and, fourth, those that are certainly malignant but inoperable.

We are coming more and more to the belief that no tumor is a safe inhabitant of the breast. Originally the majority of women with breast tumors appearing in large clinics already had a malignancy. At the present time, since the cancer propaganda, an increasingly larger number are showing up earlier with tumors that are benign. The inference is that formerly these benign tumors had produced sufficient irritation over a long number of years to cause malignancy. At the present time they are being seen in their benign stage and a simple removal of the growth is all that is required.

Age As a Diagnostic Point: Bloodgood states that there is only one authentic case of carcinoma in the breast of a woman under twenty-five years of age. He says, "If the patient is under twenty, the tumor may be left alone unless it exhibits growth or is very annoying from pain. Between twenty and twenty-five there is some doubt as to what is best to do. On the whole, accumulated experience favors operation. After twenty-five there is no question.—Operate." Both Erdmann and Finney take the position that no tumor of the breast should go unexplored.

I think it is agreed that a questionable tumor can better be diagnosed in the hands of experienced surgeons by the gross appearance of the growth than by frozen section. No man operating for breast tumors should be content to remove the growth, send it to the laboratory and wait for the report of the pathologist. He is no more competent to do breast surgery after years of operating than he was the day he began. The frozen section should be used as a check up on the gross appearance of the tumor, and where the clinical history and the gross appearance spell malignancy and the frozen section benignancy, the case should always be treated as a malignant tumor.

An encapsulated tumor is practically always benign and only 15 per cent of non-encapsulated tumors are benign, so we are reasonably safe in doing a radical breast amputation upon any tumor which proves to be not encapsulated.

The statement has been made that tumors in both breasts or more than one tumor in one breast probably means that the growths are benign. This has to be accepted with a great deal of caution for there are cases on record of patients who have presented themselves with well advanced malignancies in both breasts and Erdmann reports a case of a woman who had two discreet cancers in one breast four inches apart. Kilgore states, "The woman who survives a radical amputation of the breast for five years is three or four times more likely to have a cancer in the remaining breast than a normal woman of the same age who has never had a malignancy." He considers that the second carcinoma is a primary growth and not a metastatic recurrence. He

*Read before the Norfolk County Medical Society.

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also states that the woman who presents herself with either bilateral tumors of the breast or more than one tumor in one breast should receive a most careful examination and, if the history is suspicious, a tumor or the breast should be removed for section and study. Primrose reported that in one hundred and twenty-five cases of breast tumors it became necessary to do a double amputation in fifteen cases, eleven for bilateral carcinoma, two for carcinoma in one breast with cystic mastitis in the other, and two for chronic cystic mastitis in both breasts. Frequently a woman comes in with the statement that she has felt a mass in her breast and the surgeon fails to find the growth. These disappearing tumors are usually cysts and consequently are benign.

Both patients and a good many physicians consider that pain is a necessary accompaniment of malignancy. As a matter of fact pain is rather a late symptom, and the physician who waits for pain to advise surgery for his patient has probably doomed her to a useless operation and a cancer death. We wish to insist that a tumor alone without other symptoms demands an exploration.

It is very generally agreed that pregnancy increases the rapidity of growth in malignant tumors. Trout, of Roanoke, reports that 87 per cent of women who have had a breast removed for malignancy and who later became pregnant developed a malignancy in the remaining breast. He quotes Sistrunk as saying that a woman in the child-bearing age who has a breast removed for cancer and who has a chronic cystic mastitis in the other breast should have a simple breast amputation performed at the time of the amputation of the malignant breast or have the second breast removed at a later date. Bloodgood is responsible for the following statements: "If a lump is felt in the breast of a pregnant woman over twenty-five years of age it should be explored at once, for during pregnancy and lactation cancer disseminates with greater rapidity." When a woman knows that she had a lump in her breast before she became pregnant, immediate operation is not so essential, but it is better to remove the tumor before the birth of the child, and he selects the period between the third and fifth month as the preferable time. He also states that a lumped or caked breast in a lactating woman that does not break down and suppurate or spontaneously disappear within two weeks should be explored for malignancy.

One of the accepted signs of malignancy is the dimpling of the skin over the site of the tumor, and is best elicited by lifting the breast up from the chest wall with the tumor between the thumb and forefinger. Normally, the breast should present a rounded convex surface. With malignancy it shows a concavity or dimpling.

Retraction of the nipple, if it has existed for a long time and is without tumor or discharge, should arouse no undue suspicion. However, if it appears suddenly in a woman in the cancer age, it demands an immediate amputation of the breast and careful section through all portions for malignancy, and this holds good if retraction of the nipple is the only symptom.

Discharges from the nipple require a very careful study. They may arise from abscesses, from galactoceles or intracanalicular papilloma; in which case the discharge is almost entirely blood. The first two are distinctly benign and require incision and drainage or the removal of the growth. The papilloma is also benign but potentially malignant, and demands an amputation of the breast with careful study to determine whether a radical removal of the pectoral muscles and axillary tissue should complete the operation. Bloodgood is inclined to treat papillomatous cysts as benign, with a removal of the cyst only, but he states, if when excising the cyst, other cysts are encountered or there are a number of dilated ducts, remove the breast, or if beneath the papilloma there is no distinct wall but an invasion of the breast by the papilloma, immediately perform the radical operation for cancer. This may be a safe procedure in his hands but my feeling is that the casual operator had better consider papillomatous cysts as probably malignant. Bloodgood also states that an ulceration of the nipple, with a negative Wassermann, which does not respond to simple cleansing of the nipple and bland treatment should be considered malignant and a radical breast amputation performed at once.

Tuberculomas of the breast are usually recognized by their chronic history and the fact that for a long time there have been multiple discharging sinuses. These are best treated by simple amputation of the breast, followed by some form of light therapeusis. It

is seldom that a tuberculous breast undergoes malignant changes.

So much, then, for this rather brief survey of diagnostic points. I do not intend to take up operative procedures in detail. As a rule each surgeon has well worked out his own technique.

If the tumor is unquestionably benign and in the lower or inner quadrant of the breast, it is best removed by an incision which runs along the under and outer margin of the breast's attachment to the chest wall, and this is best determined with the patient standing up. The breast is turned back from the pectoral fascia and the tumor removed en masse. This incision is entirely hidden by the overhanging breast and the scar will not show. If the growth is in the inner or upper quadrant of the breast it is best removed by an incision that cuts straight down through breast tissue to the tumor. We should remember that the lacteal ducts radiate from the periphery of the breast to the nipple as the spokes of a wheel run from the rim to the hub. This incision should be so made as to destroy as few of these ducts as possible. This suggestion also applies to the opening of mammary abscesses.

If there is any question of malignancy of the tumor, it is best to cut straight down through breast tissue to the tumor. As the tumor comes into view under the knife, if it is benign, it should show either a distinct capsule separated from the breast tissue or the wall of a blue domed cyst. If you cut into the tumor without distinguishing a capsule, or without recognizing a cyst, or if it is a cyst but contains grumous material, it should be considered malignant. The entire area should be swabbed out with pure carbolic acid, followed by pure alcohol, and the incision in the breast carefully sutured and immediately followed by a complete radical amputation of the breast for malignancy. Never anesthetize a patient to remove a breast tumor unless you have her consent to an immediate radical amputation should it prove malignant. Recurrences in the two stage type of operation for breast malignancies run over 80 per cent, and this is true if the complete operation follows in a few days.

Cases that are probably benign but potentially malignant are best treated by simple amputation of the breast with immediate section through all the planes of the breast. The gross study should be checked up by frozen sections, and if malignancy is found a radical amputation should immediately follow. If no evidence of malignancy is discovered, a simple breast amputation is sufficient. Under this head we wish to include chronic cystic mastitis and intracanalicular papilloma.

We do not consider any type of breast amputation sufficient in malignancy unless it removes the pectoral muscles, at least in so far as is necessary to expose the axillary and infraclavicular spaces. If the growth is in the lower or inner quadrant of the breast, the dissection should remove the rectus fascia, since transmission to the liver and abdominal organs apparently is through this line of lymphatics.

Probably the usual type of breast amputation adopted by the majority of surgeons adheres closely to the technique of Meyer. In this operation the skin flaps are outlined and dissected free, then the pectoral muscles are freed from their attachement to the shoulder and the axillary and infraclavicular spaces are exposed and thoroughly cleaned out. Then this mass, together with the pectoral muscles and the entire breast are removed as one solid mass. At no time should the surgeon see breast tissue.

We class as inoperable tumors of the breast, those in which the tumor mass is firmly fixed to the chest wall, those with advanced carcinomatosis of the skin, those in which the supraclavicular glands are involved or those with either lung, liver or bone metastasis. If there is any question of this, the patient should be X-rayed before operation.

It is rather disconcerting to find how many patients show evidence of far flung metastasis from six to eighteen months after operation with no evidence of recurrence at the site of the original growth. I know of four cases recently who have had recurrence in their vertebral column.

A patient who has a large sloughing tumor of the breast from which she is absorbing toxic material should be given the benefit of a simple breast amputation, followed by X-ray. It is useless to attempt any radical relief. Another method of treating the large inoperable malignancies when they are sloughing and the patient is developing anemia from recurrent hemorrhages is to thoroughly destroy the growth with an actual cautery.

The treatment of inoperable malignancy by

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radium and X-ray is to be discussed by other men. I doubt if there is any authentic case which has been cured. However, the patients do experience some relief from pain and some shrinkage of the growth, and they should certainly be given the benefit of the treatment.

We also believe that patients should be radiated after operation for malignancy, although as yet there is considerable doubt if it prevents recurrence.

I realize that I have taken exception to the teaching of some of the larger clinics, but I am speaking for the occasional operator, the man who sees breast tumors at irregular intervals. The surgeon in the large clinic can rely, with a good deal of confidence, upon the report of his well-equipped and properly functioning pathological department. He also can rely with more certainty upon his own judgment in the question of malignancy than can the casual operator. He may be able to differentiate with reasonable certainty between benign papilloma or chronic cystic mastitis and beginning malignancy, but my contention is that if in the hands of the infrequent operator a tumor appears which, in his judgment, has the possibility of malignancy, it should be treated as such and the patient given the benefit of the doubt. The radical operation is no longer a mutilating operation, and with proper care and operative technique the woman can almost always be promised an arm and hand with but little restriction in function.

As cancer in the male breast is a rather rare occurrence. I wish to present the following case operated upon in May, 1923. He has no evidence of recurrence to date, three years after his operation, and his general condition, as you see, is apparently excellent:

George R., age 61 years, married, laborer. Admitted to St. Vincent's Hospital on May 14, 1923, complaining of a hard lump in his left breast.

His *family history* was negative.

Personal history showed Neisserian infection at 17; at the same time he had an initial lesion. No subsequent trouble. Forty years ago he had pneumonia. As a child he had a dislocation of his left shoulder, which was never reduced. For sometime he has had a swelling of feet and legs, accompanied by shortness of breath. This has been better for the past twelve months. He has had a frequency of urination for some time and gets up three or four times at night to void.

Present Illness. About a year ago he noticed a small lump in his left breast. For the last few months it has been growing rapidly. He has had some pain at times. He has had a cough for the past three weeks.

Physical Examination. Well developed negro man. He has a few small palpable glands in his neck. Teeth in poor condition. Subglenoid dislocation of the left humerus, left arm atrophied, with restricted use of arm and hand. There is a hard fixed mass in the left breast, two by three inches in diameter. There are palpable glands in the left axilla. Knee jerks are almost absent. Pupils react sluggishly to light and accommodation. He has a few moist rales in his lungs. There is an accentuation of his second aortic sound but no murmurs are heard. His blood pressure is 200/110. The X-ray department reported that there was no evidence of metastasis in his lungs but a large aneurism of his aorta. The pathological department reported a urinalysis alkaline in reaction, two plus albumin, no sugar, much granular matter and phosphatic crystals. Wassermann negative.

On May 17, a radical breast amputation was done for malignancy. He was given one H. M. C. tablet, followed in thirty minutes by morphine gr. 1/6. The dissection was made entirely under novocaine anesthesia, using two per cent for nerve block, one per cent for the skin, and one-half of one per cent for the subcutaneous infiltration. He left the hospital on May 28, 1923, with the wound almost entirely healed.

Pathological Report. Tissue consists of breast, pectoral muscle and axillary fascia. Area of skin, including nipple, 12 by 6 cm. Beneath the nipple and adherent to the skin and the fascia beneath the breast is a hard indurated mass occupying the entire gland.

Diagnosis. Medullary carcinoma of the breast with involvement of the axillary glands.

708 *Medical Arts Building.*

THE INTRAVENOUS ADMINISTRATION OF GENTIAN VIOLET AND MERCUROCHROME-220 SOLUBLE IN THE TREATMENT OF SEPSIS.*

Report of 69 Injections

By J. S. HORSLEY, Jr., M. D., Richmond, Va.
From the Surgical Department of St. Elizabeth's Hospital.

Gentian violet and mercurochrome-220 soluble belong to the group of so-called new antiseptic dyes. In 1912, Churchman, formerly of Johns Hopkins, made the first elaborate study of the bactericidal properties of gentian violet. He pointed out that Gram positive organisms were markedly more susceptible to this dye than Gram negative. In a paper presented at a meeting of the Southern Surgical Association, December 11, 1923, Young and Hill, of Johns Hopkins, first reported clinical cures of sepsis by the intravenous injection of these two dyes. Shortly after hearing this paper, I performed experiments to determine the local and general effects of gentian violet and mercurochrome given intravenously in normal dogs.

It was found that injections of very small amounts of 1 per cent solution of gentian vio-

*Read before the Junior Clinical Club, Richmond, Va., March 15, 1926.

let or mercurochrome into the subcutaneous tissues, as might occur in infiltration from a faulty vein puncture, produced only a transient mild inflammation with no subsequent sloughing or induration. The intravenous injection of a 1 per cent solution of gentian violet, with the recommended clinical dosage of from 3 to 7 mg. per kilogram of body weight, caused no apparent reaction except a transient false cyanosis due to the dye itself in the circulation. Mercurochrome in similar experiments was followed by a rather marked reaction consisting of nausea, vomiting and diarrhea. Mercurochrome was distinctly noted in the vomitus, feces and urine for the first 24 hours. The dogs appeared sick, especially those having larger doses. Practically all of either dye seemed to be excreted within 24 hours by the kidneys and gastro-intestinal tract, as determined by the gross disappearance of the dyes. The dogs were killed with ether at varying intervals, and necropsy showed the thoracic and abdominal viscera grossly normal, and microscopic sections of the liver and kidneys were normal. The conclusion was drawn that either dye in doses up to 7 mg. per kilogram of body weight could be given intravenously without causing demonstrable pathological lesions.

By further experiments on dogs with intraperitoneal injections of gentian violet and mercurochrome it was found that after 24 hours all traces of the dyes had disappeared from the peritoneal cavity and there was no subsequent gross evidence of peritoneal irritation or inflammation. So far as could be determined, the course, excretion and results after intraperitoneal injections were very similar to those following intravenous injection, except that the reaction after mercurochrome was less marked. Attempts were made to give dogs peritonitis with intraperitoneal injections of a mixture of virulent cultures of colon bacilli, staphylococci, and streptococci. A fatal peritonitis could not be consistently produced by this means. Consequently, the results on dogs with peritonitis, treated by intraperitoneal injections of these dyes, could not be definitely stated. Subsequent necropsies, however, seemed to show less peritoneal disease following the use of either of the dyes (given at intervals from a few minutes to 48 hours after the injection of the virulent bacteria) than when the dyes were not used.

Clinically I have on numerous occasions used these dyes in peritonitis cases by injecting them (chiefly mercurochrome) into the peritoneal drainage tubes. Favorable results were often noted, but these were considered only the local effects of the dyes, since too little actual absorption through the peritoneum can take place where there is ample drainage. Mercurochrome is a very efficacious local antiseptic in these conditions, but gentian violet seems to be of little local value. Further experience in clinical work will have to be accumulated before the intraperitoneal injections of gentian violet and mercurochrome in treating sepsis can be placed on a firm scientific basis. Since the Spring of 1924 there have been given by me or under my supervision 18 intravenous injections of mercurochrome in 12 patients, and 51 intravenous injections of gentian violet in 38 patients. This makes a total of 69 intravenous injections of these two dyes in the treatment of 50 patients suffering with different types of sepsis. In April, 1925, I reported 32 intravenous injections of gentian violet in 25 patients, which is also included in this series.

Preparation and Dosage

Pure gentian violet may be best obtained and kept in the powdered form and mercurochrome in the granular form. The solutions, especially of mercurochrome, do not keep well and should always be freshly made up for each intravenous injection. An aqueous solution of ¼ per cent to 1 per cent may be used. A ½ per cent gentian violet solution and a 1 per cent mercurochrome solution seem most practical, since gentian violet does not dissolve as readily as mercurochrome. Sterile freshly distilled or doubly distilled water is used in making up the solutions. All needles, syringes and containers should be thoroughly rinsed with sterile distilled water. The accurately weighed drug is then added to the proper amount of warm sterile distilled water and gently mixed. This is allowed to stand for at least half an hour. The solution does not have to be sterilized again, as it is antiseptic. Just before use the solution is filtered through sterile gauze (six or more layers). In giving gentian violet the solution must not be allowed to stand in the syringes, as this may cause the plunger to stick.

To prevent accidents, care must be taken in the preparation of the solutions. The intra-

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venous injection of any drug is not to be regarded as a slight matter. Especially is this true when such large quantities of antiseptic solutions as these are being used.

The smallest dose of gentian violet given in this series was 3 mg., the largest 7 mg., and the average was 5 mg. per kilogram of body weight. The smallest dose of mercurochrome in this series was 2½ mg., the largest 5 mg., and the average was 4 mg. per kilogram of body weight. It is often advisable to follow up the initial dose with subsequent ones at daily or two-day intervals, depending upon the amount of improvement and the general and local conditions.

One of the superficial veins of the forearm or elbow is preferable for the site of injection, though any available vein can be used. The same technic is employed as in giving neo-sal-

A careful study of the urinalyses, blood counts and smears taken before and at intervals after injections showed no change other than a transient albuminuria in those patients who had definite reactions following mercurochrome. No other ill-effects, no salivation, no permanent staining of surfaces or organs were noted, except the frequent immediate reactions which will be discussed in detail later on.

Gentian Violet. Of the 38 patients receiving 51 injections of gentian violet, 11 were cured, 10 were markedly improved, 8 showed slight or transient improvement and 9 were unimproved. There were no deaths from injections. Except for the transient, decided pseudo-cyanosis and a very temporary rise in temperature (not more than a degree F.), there were only 3 reactions of any consequence. One of these was a general reaction charac-

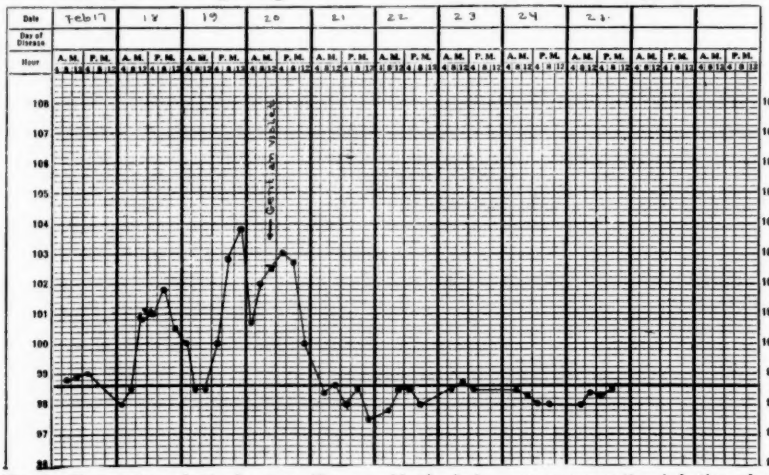

Fig. 1.—Temperature chart of a man 40 years old who had a severe suppurating infection of an abdominal wound which the usual methods of treatment failed to improve. He was given one intravenous injection of gentian violet (dose, 5 mg. per kilogram of body weight) following which his temperature dropped to normal and remained there. The incision improved very rapidly and within five days a foul, soggy, suppurating wound was clean and healing rapidly by healthy granulations. This case, with chart, was reported by me in the **Va. Med. Monthly**, June, 1925, in an article, "The Intravenous Use of Gentian Violet in the Treatment of Sepsis: A Report of 32 Injections."

varsan or any other intravenous medication. The solution should be injected slowly, at least four minutes being taken to make the complete injection. If the solution is administered too rapidly, the patient will complain of a flushing sensation of heat, slight nausea, faintness or a sensation of constriction of the throat or chest.

Analysis of the Fifty Cases

The youngest patient was 7 months and the oldest 66 years.

terized by a chill with subsequent high fever and followed by decided improvement. The other two reactions were local in character, an indurated periphlebitis extending several centimeters along the vein from the sites of injections. These cleared up after several weeks without sloughing or pain. Both local reactions, I believe, were due to a too hasty preparation of the gentian violet solution for immediate use. Incidentally, both of these cases were cured.

Of the 38 cases of sepsis treated with gentian

violet, all except 3 had smears and cultures which showed a Gram positive staphylococcic organism. Two of these had an early acute phlebitis of the femoral vein and the other a typical Gram positive staphylococcic infection with multiple recurring furuncles. These two cases of phlebitis were cured by this form of therapy. Shallenberger, of Atlanta, has reported a series of cases of acute phlebitis treated successfully by the intravenous injection of gentian violet. He stated that the most predominant etiological organism in phlebitis is a Gram positive staphylococcus, but the organism in this condition is very difficult to culture from the blood stream. In such cases a therapeutic test or trial is justifiable even if the causative bacteria cannot be cultured.

As stated above, in 9 out of the 38 cases no improvement was noted, and there were 8 with slight or temporary improvement following the intravenous use of gentian violet. A careful study of these cases shows two chief reasons for little or no improvement. The most common is a mixed infection or one where Gram positive staphylococci are either not present or not predominant. The second cause of failure is seen in those cases where the blood cannot readily reach the infected foci, as, for instance, large areas of necrosis or areas where the blood supply is scant, as in sloughs, large pus pockets, chronic necrotic bone and joint conditions. Gentian violet seems only to affect those bacteria that are accessible to the blood or lymph streams.

Mercurochrome. Of the 12 patients given 18 injections of mercurochrome, 1 was cured, 3 were markedly improved, 6 showed slight or transient improvement, and 2 were unimproved. There were no deaths from injections. No reactions of any consequence followed 7 injections; moderate reactions, consisting of nausea, a rise in temperature of 1 to 2 degrees F., and occasional mild diarrhea, occurred after 9 injections; and severe reactions after 2 injections. One of the last two patients had a chill of 20 minutes' duration followed by a temperature of 106° F., nausea, vomiting, and moderate diarrhea. There was a transient albuminuria, but no other untoward effect. This patient was, however, the only one of the series who was cured. The other severe reaction occurred in a patient with a large liver abscess. He was one of the two who were markedly improved, but died several months after leaving the hospital. Gentian violet was first tried in this case, but had no effect at all.*

Of the 12 cases of sepsis treated with mercurochrome, all had smears and cultures which showed Gram negative organisms, either in pure cultures or mixed. Nine of these 12 cases were so critically ill that mercurochrome was given almost as a last resort. Of these 9, 1 was cured, 1 very markedly improved, 6 went on to death, and 1 got well in spite of both mercurochrome and gentian violet. Of the 6 patients who died, 2 had streptococcic septicaemia with acute endocarditis; 1 streptococcic septicaemia with acute meningitis; 1 streptococcic cerebrospinal meningitis; 1 pneumococcic meningitis; and 1 streptococcic peritonitis with intestinal paresis. This series of cases, treated with intravenous mercurochrome, is too small to warrant any definite conclusions, but my impression is that mercurochrome gave best results in Gram negative infections, especially the gonococcus and the colon bacillus group. Furthermore, unless its use is followed by a decided reaction, no definite improvement may be expected.

Comment

Whether the blood stream may be sterilized by these two dyes or any antiseptics appears to me to be very doubtful. At the meeting of the American Surgical Association, May 5, 1925, Walton Martin, of New York, presented an excellent paper entitled "The Conception of Stepticaemia and the Fate of Microbes in the Blood Stream," in which he shows the futility of attempting such a sterilization. He points out the very complex and variable nature of the so-called septicaemias. He admits that there can be no question of the powerful reaction following the intravenous injection of certain chemicals; the chill, high fever, diarrhea, appearance of the patient, all suggest a violent disturbance. Further, one cannot dismiss the evidence presented of rapid recovery. But just how often this occurs, how much is due to the bactericidal action of the drug, and

*Another patient, 25 years old, suffering with a very acute prostatitis had 2 intravenous injections of a 3 mg. per kilogram of body weight dose on successive days. A mild reaction followed the second injection. Immediately after the second treatment he developed reddish patches on the skin of the groins and the flexor surfaces of the arms and thighs. The rash was transient, lasting only a few hours. For about 3 days after the injections he complained of sore gums, but had no definite salivation or stomatitis. The patient's prostatic condition was very markedly improved. The skin rash and sore gums seen in this case were not observed in any others of the series.

how great is its toxic effect on the body cells is still undetermined. It is possible that at times substances are liberated that are harmful to the bacteria, or the drug's action may be dependent on how much it stimulates or conserves the natural defense mechanism of the body. It would seem that, if the drug acted directly on the infecting organism in the blood stream, the most favorable type of patient would be one with ulcerating lesion on the heart valves and a bacteremia. This lesion is local and accessible to the antiseptic, but in spite of this such cases in this series showed only transient or no improvement, and the disease followed a progressive and fatal course.

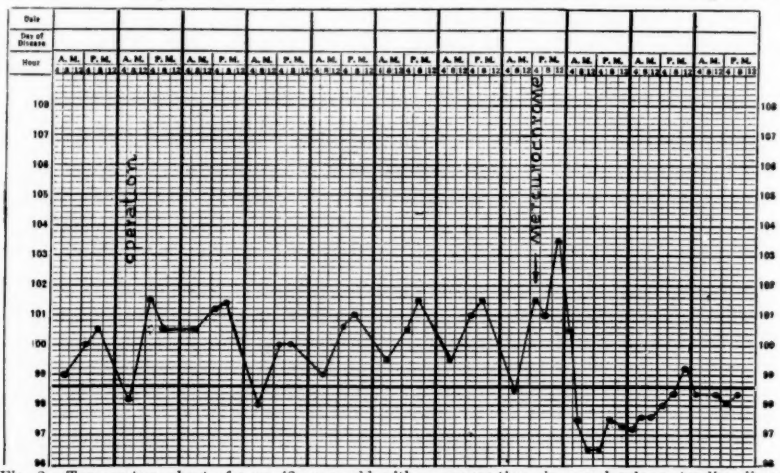

Fig. 2.—Temperature chart of man 42 years old with a suppurating sinus and a long-standing liver abscess who was given one intravenous injection of mercurochrome (dose of 5 mg. per kilogram of body weight) after operation and all other forms of treatment had been used without improvement. A moderate reaction followed with subsequent fall of temperature to normal for remaining hospital stay. Died several months later, probably from extension of liver abscess. Note the typical septic temperature previous to the injection (arrow) and the sharp rise just after the injection with the very sudden drop to normal.

The only micro-organisms so far successfully treated in the human being by drugs are the casuative agents of malaria and syphilis. There is much disagreement about the proper classification of the spirochaete, but it may be stated that neither it nor the plasmodium of malaria belong to a group of true bacteria. In neither instance do we speak of sterilizing the blood, but of curing or arresting the disease. To state that the blood is sterilized by the intravenous injection of chemicals, as a test tube containing a broth culture is disinfected, is misleading and erroneous.

Major Walker, of Hot Springs, Arkansas, has definitely shown that mercurochrome in concentrations varying from 1:25,600 to 1:400 has no appreciable effect on the bactericidal properties of fresh defibrinated blood toward the colon bacillus; that mercurochrome in a dilution of 1 to 200 completely destroys this activity; and further, that staphylococci and streptococci grow much more luxuriously in blood containing dilutions varying from 1:25,600 to 1:400 of mercurochrome than they do in fresh defibrinated blood without mercurochrome. He believes that this results from an injurious action of the mercurochrome on the leukocytes, and constitutes at least a theoretical objection to its intravenous use. Any beneficial clinical results which may follow the use of mercurochrome in septicaemia can not, in Walker's opinion, be attributed to the specific action of mercurochrome on the causative organism.

The mode of action of these intravenous drugs is quite complex and as yet unsatisfactorily explained. In some unknown way they decrease the activity and toxicity of certain bacteria, or increase the immunity and defense powers of the body, or possibly act in both ways. The ultimate clinical result seems often to be dependent largely on the severity of the reaction which follows the introduction of these dyes into the blood stream. This is especially true of mercurochrome, and is also true of bichloride of mercury (so far as I have observed in a few cases), and to a less extent it is true of gentian violet. Matas has mentioned the fact that the very ill patients, who

have reactions (chill with subsequent fever, etc.) during or following the continuous administration of 5 per cent glucose solution into the vein, seem more likely to recover than those who have no reaction. Recently I have treated 11 cases of sepsis, similar in nature to those reported in this gentian violet group, with increasing intramuscular injections of milk, and find that, following the reaction thus brought about, the benefit is often as great as after the intravenous injection of gentian violet and mercurochrome. These results, however, can not be obtained as quickly as with the dyes, though this form of treatment has fewer severe complications. I wish to give a more detailed report of this work later. It should be given intravenously only after all other customary methods of treatment have failed, or have produced too slow improvement. Their promiscuous intravenous use without thorough study of the septic condition and hospitalization of the patient is to be condemned.

Conclusions

1. In doses varying from 3 to 7 mg. per kilogram of body weight, properly prepared ½ per cent to 1 per cent aqueous solutions of gentian violet were given intravenously 51 times to 38 patients, with decided improvement to 21 and with only 3 reactions. In sepsis where Gram positive staphylococci were the

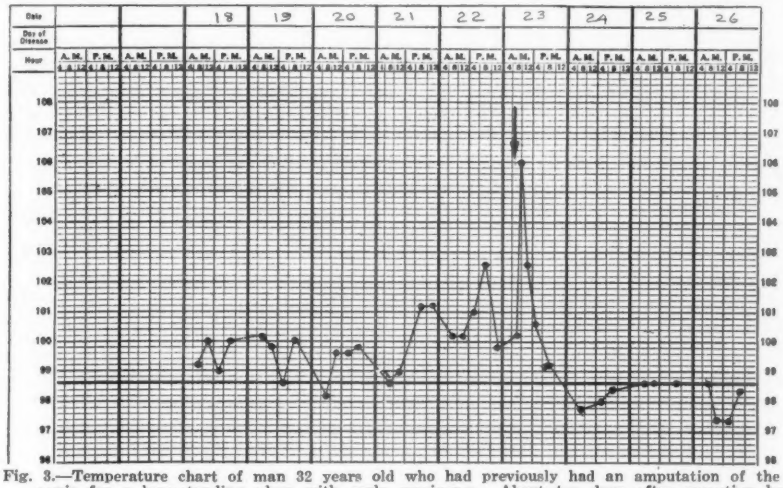

Fig. 3.—Temperature chart of man 32 years old who had previously had an amputation of the penis for a long-standing ulcer with early carcinoma. About ten days after operation he began to have slight discharge from the wound and an afternoon fever. Smears taken from the wound showed a hemolytic streptococcus and an organism simulating the gonococcus. Patient became decidedly worse and gave clinical evidence of an early septicaemia, though this was not confirmed by blood culture. One injection of mercurochrome (dose, 3 mg. per kilogram of body weight) was given, which was followed by a severe chill of twenty minutes' duration, with nausea and vomiting and a moderate diarrhea. Temperature rose to 106° F. after the chill and the next morning was subnormal (97.8° F.). His temperature remained normal for the rest of his hospital stay; the wound healed rapidly and all general and local evidence of infection disappeared. There was a transient albuminuria, but no other untoward effects. This was the only patient in the series of twelve who was definitely cured by the intravenous administration of mercurochrome.

may be stated, however, that a severe general reaction of the type described favorably influences the course of certain cases of sepsis and the benefit does not altogether seem to be dependent on some specific drug or antiseptic. Gentian violet appears to be more or less specific against the Gram positive staphylococci, even in the absence of any appreciable reactions; whereas the specificity of mercurochrome is decidedly less definite, and apparently its results are greatly influenced by the extent of the reaction. These antiseptic dyes sole or predominant etiological organism, and where the lesions were accessible to the blood stream, the intravenous use of gentian violet was justifiable and often most beneficial.

2. In doses varying from 3 to 5 mg. per kilogram of body weight, freshly prepared, 1 per cent aqueous solution of mercurochrome was given intravenously with subsequent improvement in only 4 cases of sepsis out of 12 treated. Sepsis caused by Gram negative organism of the colon bacillus group and by the gonococcus showed most improvement in this series of 18

injections. Nine moderate and 2 severe reactions occurred. An absence of reaction was usually followed by no definite improvement. The more severe the reactions (as characterized chiefly by the rise in temperature), usually the more definite and lasting was the improvement. Mercurochrome is a very powerful drug and must be given only with the greatest care and judgment.

3. Doses of less than 3 mg. per kilogram of body weight with either of the two dyes were of little, if any, value. Often several injections at intervals of one or several days were necessary to obtain the full therapeutic effect.

4. The mode of action of these intravenous dyes is complex and as yet unexplained. Similar results followed the increasing intramuscular injections of milk at repeated intervals and may occur after powerful reactions caused by other intravenous preparations.

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617 *West Grace Street.*

A RATIONALISTIC VIEW OF THE PSYCHONEUROSES.*

By DANIEL D. V. STUART, Jr., M. D., Washington, D. C.
Associate Clinical Professor of Neurology, Georgetown University.

So much has been written about the psychoneuroses during the past thirty years that the subject is getting a little shop worn. A great deal that has come out has been broad and helpful; while some has been based on ready-made ideas and pet theories, but has been useful in showing us new points of attack. Lately there seems to be a tendency to write about the neuroses in terms hard to understand unless the reader happens to have a cross-word puzzle dictionary handy. When we dissect out the underlying idea in papers of this type, if we can find it, it generally turns out to be something that has already been said a good many times in a simpler and better way. This paper does not bring out any startlingly new views. It seemed to me worth while, though, to try to formulate a common sense solution of the problem that neurotic states present.

*Read before the Medical Society of the District of Columbia, January 13, 1926.

Twenty years ago, Dubois, in his "Psychic Treatment of Nervous Disorders," came out with a rationalistic concept of the neuroses. The book had a real value, but the author held to the idea of a basic nervous instability. He felt that neurotics were of unsound timber to start with; and so, in reading his work, we find the curious contradiction of a man trying to cure by re-education a condition which he believed to be at bottom incurable.

For three-quarters of a century psychiatrists have been hunting for an explanation of the various kinds of mental disturbances, and it seems to me that only in the last two decades has any real headway been made. The longest stride forward lies in the modern tendency to regard mental disease in general, and the psychoneuroses in particular, as problems of personality—failures of adjustment of the individual to his circumstances of life. This viewpoint is fairly widely accepted; but when it comes to finding the reasons for these maladjustments, the explanations presented range all the way from the neurotic constitution hypothesis, which dies hard, to the latest assumption of Freud's followers. Literally, one man's opinion is as good as another's; provided, only, it is backed by a reasonable amount of training, experience, and judgment.

My own idea of these neurotic personality problems has only taken shape within the past six years. I may have to change it in some details as time goes on, but I believe that it is in the main basically sound. For my own purposes I would divide people at large into three main groups:

1. n NORMAL
(With Variations).
2. n PSYCHOTIC
(With Variations).
3. n CONSTITUTIONAL MENTALLY DEFICIENT
(With Variations).

It seems to me that a pretty distinct dividing line separates the normal from the psychotic group, though most psychiatrists see no clear cut distinction between them. Commonly they lump all mental disturbances under the latter heading, and regard certain of the psychoses,

such as the schizophrenic, manic depressive, and paranoic types as being purely psychogenetic—that is, born of the patient's own distorted thinking. As for the psychoneuroses, the general trend is to look on them as a sort of halfway station between normality and the graver forms of mental illness. For a number of reasons that cannot be taken up here, I do not hold to this view of the situation. My belief has always been that the out-spoken psychoses, with the single possible exception of the manic depressive type, have a real foundation in physical pathology, though their symptoms may develop from a psychogenetic basis. This is partly borne out by some recent investigations. The psychoneurotic patient, on the other hand, seems to me to be at his worst only a variant of the "normal" main group. This is the first point to be stressed. To me it is the key-note of the whole explanation of the psychoneuroses. A little observation will soon convince any one that the symptoms from which a neurotic patient suffers, no matter what they are nor how severe, represent nothing but the exaggeration of something which every so-called normal individual experiences at times. To put it in another way, every human being reacts to his problems and difficulties of life in exactly the same way and sometimes with the same exaggerations as does the neurotic. Also, it is perfectly plain that these reactions are only the expressions of anxiety aroused by the circumstances with which the individual is confronted. For these reasons I think of the psychoneurotic as a variation of the normal group.

The second point to be emphasized is that this variation can hardly be considered an indication of inborn weakness, nor the result of physical disease. The old neurasthenia and psychasthenia concepts of Beard and Janet would have it that the neurotic is constitutionally unable to stand the same amount of stress in the shape of the difficulties of life as the stabler individual is. If this were true, the treatment of psychoneurotic states would be more hopeless than even our present day handling of the cancer problem. By no known method can constitutional weakness be transformed into constitutional strength, yet we all know neurotic patients who have quite literally recovered: who have not simply gotten rid of their symptoms, but who have reached the point where problems as great as those responsible for their upset in the first place, sometimes the very same problems, no longer disturb them. Now, of course, no such thing could happen if these people's symptoms had their origin in an inherited inability to stand stress and strain. In that case they would certainly again show their anxiety reactions under like conditions of strain, since no treatment of any kind could possibly raise their constitutional limit of endurance. As for physical disease, it is perfectly true that the symptoms due to a visceroptosis, or to eye-strain, or to any illness, may bring to light an otherwise latent neurosis. It does not require any stretch of the imagination though to put such conditions in the class of problems too great for a potential neurotic to handle without difficulty; and I do not see how they can be thought of as creating a neurosis out of whole cloth. Physical illness in a neurotic should, of course, be properly treated, but relief of physical symptoms never yet cured a neurosis. Nor can the maladjustment of the neurotic patient be accounted for by the kind of problem that he is called on to face. His difficulties are never, generally speaking, different from those with which every one, neurotic or non-neurotic, is confronted at times; whether they concern his bodily health, his own thought processes, or his external circumstances. It seems to me impossible to escape the conclusion that the neurotic patient's troubles, his failures of adjustment and inadequacies, are the out-growth of nothing more formidable than his own mental attitude toward these same problems,—an attitude essentially of timidity, a lack of sureness of his own ability to handle his difficulties satisfactorily.

Now I do not for a moment believe that one baby is born with the capacity for developing sureness of self in later life and another baby without that capacity. I believe that the amount of self-confidence we possess is determined wholly by the effect of our childhood training and surroundings. Human beings have certain inborn character traits, inherited, if you like, among which are imaginativeness, sensitiveness, and quickness of response to emotional stimuli. Every neurotic patient belongs in the imaginative, sensitive, and emotionally quick class, but there is nothing abnormal about these attributes. Plenty of people who have them are quite stable in their reactions; therefore, we cannot regard these traits as evidence of a neurotic make up.

XUM

When the childhood history of a neurotic patient is carefully taken, it nearly always develops that during his formative years he was subjected to methods of training which fall roughly into one of three groups. Either he was brought up by parents or other adults who over-sheltered him from the small but very real problems and difficulties of childhood; or, rarely, exactly the reverse was true, and he was so abused and beaten about that his tendency to self-assertiveness was broken; or, if neither of the above circumstances played a part, he was surrounded by an atmosphere of tension and anxiety in the grown people with whom he was most closely associated. Finally, another faulty factor, which might be classed broadly as environmental, enters into the childhood life of a small group of neurotics. I refer to physical defects, among which stammering, deformities of all kinds, and deafness, seem to me to be the most important. I do not see how any of these types of upbringing, or the physical handicaps mentioned, can fail to make a lasting impression on the developing mind of an imaginative, sensitive, emotionally quick child; and it seems to me that the net result of all of them must be the same. They must all prevent such a child from acquiring the amount of self-confidence that would allow him to meet the problems of life with a comforting sense of his own fitness. By the same token, exactly these same circumstances might have little or no effect on a more stolid and less emotional child. This last assumption would account satisfactorily for the fact that some members of a family may be highly neurotic, while their brothers or sisters, brought up under the same conditions, may be quite free from any so-called nervous taint.

The above sums up in my mind the neurotic situation as briefly as it is possible to outline it. The whole thing might be expressed in some such formula as this: The neurotic patient is a sensitive, an imaginative, and emotionally quick adult, and was a sensitive, an imaginative, and emotionally quick child. His formative years were spent in an atmosphere that acted as a drag on his developing self-confidence. As a result, he grew up unable to face the problems of life with any real ability to gage and handle them properly. This inability, in turn, gradually bred in him a latent chronic anxiety which forces its way into consciousness whenever its possessor is faced with a problem greater than he can handle with comfort. Lastly, the forms under which this anxiety shows itself are what we call the patient's symptoms, and these forms are determined by purely accidental circumstances.

So far, for the sake of clearness, I have not spoken of the Freudian theory of the psychoneuroses; but it is far too important to leave untouched. Freud has done a tremendous service to the study of mental illness by calling our attention to the need of interpreting symptoms and by turning a searchlight on a taboo subject. There is no doubt at all in my mind that his concept of a polymorphous, perverse sexuality in childhood, is correct. Any one who watches the development of children from two to six years of age will soon be convinced of its truth. Neither do I doubt that fixation of psychosexual development may occur at any childhood level; and I am sure that many neurotic and psychotic symptoms are the direct expression of such a fixation. I do not believe, though, that this process ever takes place in children who have been taught to stand on their own feet.

The above is what I mean by a rationalistic view of the psychoneuroses; all of which seem to me to be at bottom identical,—from a major hysteria to the same sort of mild anxiety which most of us feel when we have to meet a disagreeable situation. If this view is correct, the treatment of all these conditions must also be identical, and it must take the form of an effort to build up in the neurotic the ability to stand on his own feet in the face of his problems of life,—to develop his under-developed self-confidence. Everything else—the explaining away of symptoms and the bringing to light of submerged fixations—is secondary to this objective. It can be accomplished if the patient really wishes to get well, and if he has intelligence and tenacity of purpose. When I speak of wishing to get well, I do not mean to imply that the psychoneurotic consciously enjoys his complaints. Ninety-nine times out of a hundred he wants desperately hard to be rid of his symptoms. However, shaking off the symptoms would entail his taking up, like every one else, the problems and burdens of life. This is more than he can face with comfort, and so, of the two evils, neurosis or the facing of life's hardships, he chooses the former. Generally, this choice is

an unconscious one, but I am certain that sometimes the patient knows perfectly well what he is doing.

If he is properly brought up, a child learns sureness of self as effortlessly as he learns his own language. Through the example shown him by those who bring him up and through the direct teaching which he receives, he learns to size up and evaluate his simple problems, and to fight his own battles. The questions that he puts to his parents, many of them prompted by his own biological trends, are answered sensibly and as fully as possible. The result of all this is a healthy matter-of-fact attitude, which serves him in good stead when he is called on to face the more complex difficulties of grown life. A patient who is to be relieved of a neurosis must first of all be shown that his trouble is nothing to be afraid of. He must be convinced that his neurosis really had its roots in nothing worse than the concept which I have given above. Above all, he must be taught not to consider himself a constitutional weakling. Once that is firmly fixed in his mind, his ever-present fear of his own condition is largely done away with and the first step towards recovery is accomplished. Next, he must be taught to evaluate his own difficulties in order that he may see for himself how much overweight he has been giving to them. Sureness of self and an increased ability to face life satisfactorily follow automatically. All this takes time, patience, and tact on the part of the physician; and, on the patient's part, as I have said, intelligence, perseverance and the will to recover. Given this combination, I believe that it is possible to re-educate any neurotic, and to send him away better armored against a recurrence of his upset than he was against its onset in the first place.

The Wyoming Apartments.

A CASE OF TUBERCULOUS PERITONITIS TREATED WITH AIR INJECTIONS.*

By NELSON MERCER, M. D., Richmond, Va.

Historical Summary

In 1912, Godwin reported in the *Lancet* that he had injected oxygen into the peritoneum of patients during abdominal operations and had noticed improvement in their symptoms.

*Presented at a meeting of the Richmond Academy of Medicine, May 11, 1926.

Bainbridge, of New York City, in 1913, found that beneficial effects were produced in patients with tuberculous peritonitis when oxygen had been injected into the peritoneum for stereoscopic X-ray pictures of the abdominal viscera and adhesions. In 1921, Stein and Stewart described the technic of pneumoperitoneum when employed for therapeutic purposes in patients with tuberculous peritonitis and they used air instead of oxygen in their work.

Mattick and Gilbert, of Colorado, simplified the technic by using the same needle for the removal of the fluid and the injection of the air, reporting two patients who had been benefited in 1924 by this treatment. Only a few patients throughout the United States have been treated by this method for the relief of symptoms and the removal of the peritonitis.

Theories of Action

First: The foreign body, air, injected into the peritoneum causes a marked reaction of the tissues to the infecting organism.

Second: The air or some of its elements under pressure has a specific action on the tubercle bacilli in the peritoneal cavity, causing their destruction.

Comparison With Other Treatments

First: Pneumoperitoneum in tuberculous peritonitis is the simplest, safest, and most logical method of treatment.

Second: It can be repeated as often as necessary until all fluid and symptoms disappear and remain away.

Third: It is worthy of universal practice in tuberculous peritonitis as it offers better prospect of cure within a shorter time than laparotomy, heliotherapy, and X-ray, without the dangers of a major operation and general anesthetic with the attendant shock to the patient.

Report of Case.

F. B., colored girl, age 14 years, attending school. Referred by Dr. A. E. Turman, on April 24, 1926, for treatment for tuberculous peritonitis and pulmonary tuberculosis.

Chief Complaint—Marked fatigue on least exertion and in the morning upon arising.

Other Symptoms—For past two months has run temperature of 102 to 103 daily in the afternoon. Dyspnea marked. Abdomen distended with fluid. Diarrhea and indigestion for past three weeks with abdominal pain frequently.

XUM

Family History—Negative.

Past History—Negative.

Present Illness—For past two months has lost much weight and noticed marked fatigue on least exertion and in the morning when dressing. Two weeks ago her abdomen became distended with fluid to a marked degree, causing much dyspnea and distress generally. For past three weeks she has had diarrhea with indigestion after eating anything, and abdominal pains were frequent. Daily temperature was 102 to 103 for last two months. On April 19, 1926, she acted in a school play and had to be carried home after she had collapsed. During this time she had not rested at all during the day and had kept up her school work. The diagnosis of tuberculosis was not made until Dr. Turman was called to see her on April 22, 1926, when he advised immediate treatment.

Physical Examination—April 24, 1926, at my office, 9 A. M. Emaciated young colored girl. Dyspnea marked. Abdomen distended with fluid. Temperature 101½, pulse 140, respiration 26. Weight 80 pounds.

Lungs showed moist medium and coarse rales throughout left lung and in right upper lobe. B. B. and whispered pectoriloquy above second rib on left side.

Heart action was regular. No murmurs. Not enlarged.

Blood pressure was 105-70.

Abdomen was distended with fluid wave. Flatness over the lower half when sitting up, changing with position, and tympany above the flatness.

The cervical and inguinal glands were palpable.

Extremities were negative.

Urine was negative.

Blood examination showed: W. B. C., 9,000; differential: polys 66%, large lymphocytes, 12%; small lymphocytes, 20%; large mononuclears, 2%.

X-ray report (by Dr. E. L. Flanagan), May 8, 1926:

Right lung—Radiographic examination of the chest shows slight structural changes along the first intercostal branch, due to a number of small cottony deposits resembling tuberculous infiltration.

Left lung—There is an area of infiltration around the hilum about 1½ ins. in diameter; extending from this are seen the first and second intercostal branches well delineated, which show some cottony deposits along their distribution into the outer lung zone.

The heart is of normal contour and position. The diaphragm is smooth. The costo-phrenic and cardio-phrenic angles are clear.

The above findings indicate moderate infiltration of both upper lobes with tuberculosis of recent origin.

TREATMENT WITH PNEUMOPERITONEUM

Date	Amount of Fluid Removed	Amount of Air Injected
April 24, 1926	1000 c.c.	1500 c.c.
April 26, 1926	500 c.c.	900 c.c.
April 30, 1926	500 c.c.	200 c.c.

The same needle was used to remove the fluid and inject the air, with novocain.

A Loving pneumothorax apparatus was used to inject the air.

At each inflation the air was injected until the abdomen was dome-shaped and liver dullness was obliterated.

There were no unfavorable symptoms experienced by the patient after each inflation, and her breathing became much better immediately after removal of the fluid the first time.

After the third aspiration and inflation all fluid has disappeared and the air is being gradually absorbed.

PROGRESS NOTES

April 24, 1926—Referred for treatment. Came to my office walking at 9 A. M. Examination as above reported. Aspiration of 1000 c.c. peritoneal exudate and injection of 1500 c.c. of air through same needle by means of Loving pneumothorax apparatus. Novocain was used locally. No reaction. Put to bed for rest at home. Soft diet. Fresh air. Dilute hydrochloric acid, fifteen drops, after meals. Diarrhea marked, six watery stools daily with griping pains in abdomen. Indigestion after each meal. Temperature at 9 A. M., 101½, pulse 140, resp., 26.

April 26.—Visited patient in her home. Removed 500 c.c. fluid from peritoneum and injected 900 c.c. air. Stood the operation very well. No reaction. Diarrhea continues. Temp. 103, pulse 120, resp. 24.

April 28—Visited patient in her home. Not enough fluid to warrant removal today. Diarrhea continues. Indigestion less marked. Cough less. Temp. 104, pulse 120, resp. 24.

April 30—Visited patient in her home. Removed 500 c.c. peritoneal exudate and injected 200 c.c. air. Stood the operation very well. Cough better. Indigestion much better and diarrhea less. No pain in abdomen. Temp. 103, pulse 120, resp. 22.

May 2—Visited patient in her home. No diarrhea or abdominal pains. No fluid in abdomen. No indigestion after eating. Much brighter. Temp. 103, pulse 100, resp. 20.

May 4—Home visit. No diarrhea, indigestion, nor abdominal pains. No fluid. No cough. Temp. 102, pulse 100, resp. 18.

May 6—Home visit. No fluid. Twenty-four hour bed rest continued. Patient much brighter and feels better generally. No abdominal symptoms whatever. Temp. 100, pulse 96, resp. 18.

May 7—Patient was taken in automobile to Dr. Flanagan's office for X-ray of abdomen and chest. Stood trip well.

May 8—Home visit. No abdominal symptoms nor

fluid. Fewer rales in lungs. Slightly constipated. Menstrual period about due. Temp. 100, pulse 94, resp. 18.

May 10—Home visit. Feels much better. No symptoms of importance. No fluid. Temp. 100, pulse 92, resp. 18 at 4 P. M.

Comment

This is the first patient treated by this method in Richmond.

Due to the tuberculous disease in her lungs, she will have to continue the constant bed rest for an indefinite time.

The pneumoperitoneum treatment has entirely cleared up the tuberculous peritonitis and all of its symptoms which were causing so much distress before treatment was begun.

This method of treatment is considered the best for tuberculous peritonitis.

1100 West Franklin *Street*.

Discussion

Dr. Wyndham Blanton, *Richmond*:—Dr. Mercer's paper brings to mind three cases:

First, that of a young man with tubercular peritonitis and fluid in the abdomen, who was several times tapped and inflated with air. He left the hospital without improvement.

Second, a young woman who showed the same symptoms, and who was operated upon with the usual removal of the fluid and exposure of the viscera to air. It has now been two years and she is apparently well.

The last case is that of a man who was tapped for fluid in the abdomen, and six hours later died of hemorrhage into the peritoneum.

Dr. Lazarus Karp, *Richmond*:—I would like to ask Dr. Mercer two questions:

First: Did the patient have severe pain in her shoulders after the inflations?

Second: Would utra-violet ray produce the same results as pneumoperitoneum in this patient?

Dr. Nelson Mercer, *closing the discussion*:—I thank Dr. Blanton and Dr. Karp for their interest in this subject. In answer to Dr. Karp's question about pain in the shoulder, I am glad to say that the patient did not experience any unfavorable effects of the inflations, not even abdominal discomfort which so often occurs within the first twenty-four hours following the injections.

In regard to the use of ultra-violet ray in this patient, I do not believe that it would have been effective until after the fluid had been removed, and even then I doubt that it would have produced the same satisfactory results as the air inflations. Of course, ultra-violet ray is used extensively in treating the complications of tuberculosis, such as enteritis, bone and gland involvement, and in skin lesions, and recently it has been employed in treating laryngeal tuberculosis with good results.

THE SIGN OF THE SMILE

We are weary a-walking the highway of life,
We are fretted and flustered with worry and strife.
Let us drop by the wayside the heavy old load
And rest at the inn, in the turn of the road.
Let us tarry awhile at the sign of the smile.

—*Selected.*

REPORT ON SPUTUM EXAMINATIONS OF 1,425 CASES OF PULMONARY TUBERCULOSIS.

By R. CANNON ELEY, M. D.,
and
FRANK B. STAFFORD, M. D.,
Blue Ridge Sanatorium, Charlottesville, Va.

The object of this paper is to show the incidence of tubercle bacilli in the sputum of patients admitted to this institution with regard to the stage of the disease, and with a brief discussion of its significance. In reviewing these cases we were careful to exclude all those in which a positive diagnosis of pulmonary tuberculosis could not be made. Therefore, those regarded as non-tuberculous and "suspicious" are not considered in the following tabulation:

It is probably advisable to first state the method that is used in examining sputum of all patients that are admitted to Blue Ride Sanatorium, which is as follows: Routinely on admission three consecutive examinations are made from the sputum by the direct method, without any attempt at concentration, the Ziel-Neelson process being employed. The patient is given a container, and instructed as to just what is desired; this instruction consists in having the patient save the first sputum in the morning after waking. During the night while sleeping there is very little coughing and expectoration done usually, and by morning the secretions have collected in the bronchi in a more concentrated form. This is the best material for the examination and is most apt to contain the bacilli. The portion selected for the examination is the tiny "cheesy masses" or muco-purulent material mixed with or floating in the sputum. Smears made from blood streaked sputum or that obtained immediately following hemorrhage may give a positive examination, where prior to that it had been repeatedly negative. Now, if the routine examination of the three specimens taken on consecutive mornings should be negative, the concentration method is employed. This is as follows: The sputum is obtained in the same manner as described above, and to it is added 4-5 c.c. of 15 per cent sodium carbonate solution. Seventy per cent alcohol is added, a volume equal to the amount of sputum, and the final volume centrifugalized at a high speed for three hours. The fluid is poured off, and a smear made from the precipitate. This method of examination is of course more effi-

cient. Many cases who on direct examination were found to be negative showed the presence of bacilli the first time when the concentration method was used. Routine sputum examinations are made every two months on all patients, in addition to those done on admission and discharge.

In accordance with the classification accepted by the American Sanatorium Association (September, 1922), all pulmonary lesions are divided into three classes. They are: 1. minimal (incipient); 2. moderately advanced; 3. far advanced. Here we use this classification and the cases listed in the table below are based on it.

Minimal (Incipient): Slight lesion limited to a small part of one or both lungs. No serious tuberculous complications.

Moderately Advanced: A lesion of one or both lungs, more widely distributed than under minimal, the extent of which may vary, according to the severity of the disease, from the equivalent of one-third the volume of one lung to the equivalent volume of an entire lung, with little or no evidence of cavity formation. No serious tuberculous complications.

Far Advanced: A lesion more extensive than under moderately advanced, or definite evidence of cavity formation, or serious tuberculous complications. The X-ray findings are used in correlation with the physical signs in making these classifications.

In order to make a positive diagnosis, a full history, which includes possible hereditary tendencies, contact, exposure, etc., as well as the symptoms, is first taken. This is then followed by a thorough physical examination, X-ray examination, routine laboratory work, and any other examinations which may be indicated, such as basal metabolism, etc. Finally, after due consideration has been taken of the above findings, the diagnosis is made. By using this routine, we feel that the chances of error are minimized, and the best results obtained.

The *history* in cases of known or suspected tuberculosis should be carefully taken. This is, of course, a slow, tedious and laborious task, yet it is from this that we often glean the most important points. It should not only include the present symptoms, but should include all possible exposures since infancy and early childhood, for we now believe the primary infection largely occurs at this period, and its manifestations in later life are precipitated by other conditions that have lowered the resistance of the individual. The history is often the chief means in establishing the diagnosis, and especially is this true of the early cases. The physician is too anxious to think that the diagnosis rests on the physical signs, and is inclined to seek consultation, where a thorough study of the history would afford him sufficient information to establish a diagnosis. Furthermore, the prognosis cannot be made before the history, which includes the symptoms, is carefully studied to determine the clinical course of the disease.

The *physical examination* is equally important as the history, and should be executed in the most careful manner, inspection, palpation, percussion, and auscultation being used. There are many cases in which the physical findings alone will not justify a positive diagnosis, and it is in these cases that the history plays an important role. Briefly, the presence of moderately coarse moist rales heard during inspiration following expiration and cough in either apex above the second rib in front or the third dorsal spine behind means active tuberculosis until it can be proven due to some other cause.

The *X-ray* examination is often merely corroborative, yet it is of great value in those cases in which there is some hesitancy in making the diagnosis. In other cases, especially those in which the lesion is very deep, or the disease is in its exudative state, it will afford a means of diagnosis when all others fail.

Hence, we see that in order to make a positive diagnosis of pulmonary tuberculosis, all things must be considered, and not too much stress placed on any one. We feel that our report on the sputum examinations illustrates this point.

The following figures are the results obtained by studying 1,425 consecutive cases in which a positive diagnosis of pulmonary tuberculosis was made:

TABLE OF CASES

Class	Total Number Cases	Number Positive	Number Negative	Percentage Positive
Minimal (Incipient)	482	40	442	8.3%
Moderately Advanced	401	203	198	50. %
Far Advanced	542	451	91	83. %

The above percentages showing bacilli will not be found to be as high as those reported from other sanatoria, (Trudeau, N. Y., 1924, reports min. 30 per cent; mod. adv. 78 per cent; far adv. 93 per cent) which may be explained on this basis. First, our classification of the cases is strictly in accordance with that of the American Sanatorium Association (as specified above). Second, only those cases in which there is a reasonable chance of improvement are taken into this institution, care being exercised to exclude the hopelessly advanced. This is not the condition in some of the institutions where every class is received. The large number of cases classified as "Minimal Tuberculosis" illustrates this point. Hence, in a similar report of 1,425 cases, the percentage would be higher in the other institutions. By admitting only those cases that have a reasonable chance of improvement, we are able to do the most good to the greatest number. Whereas, if the sanatorium were filled with hopeless cases, the number of admissions would be greatly decreased, and many cases kept out who could have been restored to health and returned to their homes to lead a life of usefulness. The motive is truly altruistic, and not a selfish one. Longevity is obtained for the greatest number in this manner, at the expense of only a few.

It will be seen that these results well illustrate the fact that if a diagnosis of tuberculosis in its early stages is to be made, it must be made largely on the history, physical examination, and X-ray findings, for in these cases the sputum is usually negative. Never wait until the organism has been demonstrated in the sputum before making a positive diagnosis, for this delay only furthers the ravages of the disease. Even the far advanced cases often give a negative sputum on repeated examinations. This is well illustrated by one of our cases in which the history, physical, and X-ray examination all pointed to a far advanced condition, but it was necessary to make fourteen sputum examinations before the organism could be demonstrated. Krause states that the diagnosis of early tuberculosis must usually be made while the sputum is negative. This point cannot be emphasized too strongly. The presence of bacilli in the sputum bears the same relation to the case as does hemorrhage; namely, that the lesion is no longer confined to the interstitial tissues of the lung, but is now parenchymatous in location, and is producing some ulceration.

The practitioner is, of course, a busy man, and does not have time to execute all the laboratory tests on his patients that he would like. However, the medical profession has advanced to the point that practically every town or city in the State has an up-to-date laboratory that can easily make repeated sputum examinations. Furthermore, the State Board of Health will not only make these examinations free of charge, but will also furnish the containers for collecting the sputum. This requires very little time, and may be the real means of establishing the diagnosis at a time when the patient has a good opportunity for recovery. Is the patient not entitled to this consideration? The answer is obvious. Any patient having a cough or any expectoration lasting as much as four weeks and which does not respond to treatment, should be considered suspicious of tuberculosis, and a specimen of the sputum should be collected and examined for tubercle bacilli.

Recently a case was recited to us by a physician who had seen a case of suspected tuberculosis in consultation. A definite diagnosis of tuberculosis was made by the consultant, but the family physician, doubting this, began to send specimens of sputum to the laboratory for examination for tubercle bacilli. The first two specimens were reported negative, but the third was positive. The physician, still doubting the diagnosis, stated that the majority always ruled, and that the presence of two negative and one positive examination was in his estimation sufficient evidence that the patient did not have tuberculosis.

Conclusions: (1). Of 1,425 positive cases of pulmonary tuberculosis, only 44 per cent showed tubercle bacilli in the sputum. According to the stages of the disease they are as follows:

Far Advanced	83%
Moderately Advanced	50%
Minimal	8%

(2). Too much emphasis cannot be placed on *repeated* examinations of the sputum in any case where there is cough and expectoration persistent for more than four weeks.

(3). The presence of tubercle bacilli in the sputum is significant of a parenchymatous lesion, with ulceration, except in those cases

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in which a caseous node ruptures through into a bronchus and expels the bacilli.

(4). In the presence of other evidence the diagnosis should not be postponed until tubercle bacilli appear in the sputum. *The earlier the diagnosis, the better the prognosis.*

(5). And, lastly, the diagnosis of tuberculosis may not rest on any one point, but a consideration of many. The history, if carefully taken and thoroughly studied, may be sufficient to diagnose the case early.

THE CAUSE AND TREATMENT OF URINARY CALCULI.*

By BLANTON P. SEWARD, M. D., Richmond, Va.
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A subject as comprehensive as "The Cause and Treatment of Urinary Calculi" can scarcely be treated adequately in the time allotted for this paper. The complex problems concerned in the causation of calculi have not been fully work out, although our knowledge of stone formation, still quit meagre, has been advanced by recent contributions. By applying this knowledge, we are more hopeful of reducing the occurrence of urinary calculi, and particularly, in diminishing the number of recurrences.

Since the day of Hippocrates much has been written upon the phenomenon of calculus formation. The fanciful ideas of the ancients and physicians of the Middle Ages have been superseded by the more or less speculative and unscientific theories of modern writers. Some of these theories inspired investigation, though the majority will be ranked among medical legends.

With the advent of genitourinary surgery as a specialty, more critical attention has been given the abnormal deposition and fusion of crystals into concretions. Theories formerly held as the cause of calculi are no longer tenable. In recent years the theories of infection and stasis have gained such widesprad popularity that they are considerd the chief causes of calculus formation in the biliary and urinary systems. Indeed, they are so popular we are likely to dismiss the subject without adducing further factors in stone formation. The thoughtful student is not satisfied with these hypotheses and he will endeavor to find other causes which seem more fundamental.

*Read before the Richmond Academy of Medicine, March 23, 1926, also before the Southside Virginia Medical Association, at Farmville, June 8, 1926.

We cannot admit that infection and stasis are entirely satisfactory explanations of calculus formation. If infection is to bear the responsibility for the formation of calculi, we ought to find stones in practically every case of long standing infection in the urinary tract. Why do we not find them in all cases of tuberculosis of the kidney and in all cases of pyelitis? Actual experience shows that a stone in these conditions is a comparatively infrequent finding. If infection is the etiological factor, we should expect to find, as Cabot and Crabtree pointed out a larger number of females affected with calculi than males, for a larger number of women show urinary tract infection. But males are more often affected with calculi.

If stasis is the causative factor, we should expect to find stones in all cases in which there is any obstruction to the passage of urine from the kidney to the meatus. This would be true in cases of ureteral stricture and prostatic hypertrophy, for in both there occurs stasis, often with infection and decomposition of the urine. Such cases in which calculi are found are small in comparison with the number which have one or the other of the conditions. We would expect to find stone formation resulting from hydronephrosis, yet in considering the causes of hydronephrosis we think first of stone as the cause and not the result.

Infection and stasis may favor the causation of stone by intensifying the inflammation of an already malfunctioning kidney,[1] or by changing the reaction of the urine. The evidence, however, against infection or stasis as the cause of calculi in all cases is strong. The absence of a calculus in a majority of patients showing either infection or stasis, the occurrence of calculi in the new-born, the X-ray demonstration of a calculus in a person in whom the clinician did not suspect its existence, and finding a stone in sterile urine, raise the question whether there is not some more fundamental factor at work in bringing about stone formation. We know stones are frequently associated with infection when the patient comes under observation, but we are not willing to say the infection was the cause except in certain types of calculi the composition of which is revealed by chemical analysis and by a study of the urine. The urologist finds many more patients with infection and

without stones than he finds with infection and stones. The inference to be drawn, therefore, is that infection and stasis are only contributing factors in the formation of stones, and, in particular cases, cause the stone forming mechanism to work to a better advantage.

In seeking the cause of calculus formation, it is logical to make a study of the solids dissolved in the urine and the hydrogen ion content of the urine. The formation of sediments, precipitates and concretions in the secretions of the body is due to a disturbance in the solubility of the dissolved substances. A knowledge of the laws of solubility is the starting point to the understanding of the mechanism of stone formation.

The urine normally is a supersaturated solution when compared with plain water. The solids dissolved in the urine—uric acid, urates, calcium oxalate, calcium carbonate, calcium phosphate, ammonium and magnesium phosphates, and less often cystin and xanthin, all of which may be constituents of calculi—are insoluble in water even within the range of the acidity or alkalinity of the urine. When these solids go into solution they dissociate into ions each bearing opposite electric charges. There is a limit to the degree of solubility of a solid in a liquid. The amount disolved is influenced by the temperature—the higher the temperature the greater the amount of solid going into solution. When the temperature is reduced the solvent may still hold the solute in solution. It is then spoken of as a supersaturated solution. A supersaturated solution is unstable. Most of the crystalline constituents of the urine are salts which dissociate into their ions carrying positive or negative charges. The acids are also dissociated; the hydrogen ion concentration thus derived determines the acidity of the urine. The dissociation takes place in stages and ultimately has a bearing on the hydrogen ions in concentration and the solubility of substances in the urine. The dissociated ions bear a definite relationship to the undissociated molecule. Near the saturation point the proportion of free ions is important for the addition of an excess on one side or the other will disturb the equilibrium and cause a precipitate.[1] Plainly speaking, the addition of a crystal to an already oversaturated solution will bring about a deposition of the excess crystals. While this is a law of the solubility of solids in water, more intricate factors are encountered in the urine; still, we can assume that a similar phenomenon takes place.

Factors governing the solubility of solids in the urine are the metabolism of substances which are precursors to those found in the urine; the reaction of the urine as determined by the hydrogen ion concentration; and the urinary colloids. As these factors determine the solubility of crystalloids, a derangement of one or more of them must be accountable for the formation of a calculus.

A normal metabolism protects against an excessive concentration of solids in the urine by eliminating a smaller amount in the feces. Excessive concentration of urinary solids may occur from eating large quantities of food which give rise to these solids, or from improper digestion and absorption from the gastro-intestinal tract with consequent poor assimilation by the body tissues.

Experimental feeding of animals with oxamid, a derivative of oxalic acid, increased visibly the deposit of crystalline material in the urine.[2] It is a known fact, also, that individuals have had one or more calculi after eating over a prolonged period foods having a large percentage of constitutents found in those calculi. Under a strain the tissues may no longer be able to metabolize those substances, an excessive amount occurs in the urine and, from a chemical standpoint, the addition of crystals to an oversaturated solution produces a precipitate. This may show only a transient presence of crystals, and a readjustment of the diet, if the patient can be seen in time, may prevent such a precipitation. Otherwise, excessive deposition has become more or less permanent, resulting in the formation of a concretion.

A change in the hydrogen ion content of the urine may lead to stone formation even in the absence of an excess of crystalloids. The calcium salts normally soluble in high acidity become insoluble as the acidity diminishes. Uric acid is more soluble in a weakly acid urine and is precipitated in a hyperacid urine. The phosphates are precipitated from an alkaline urine. The urine may be alkaline on account of ammonical decomposition due to bacteria. The normal hydrogen ion content of the twenty-four hour urine is given as Ph^6 to Ph.[7] The acidity increases as the lower figure is approached. The hydrogen ion con-

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tent is more dependent upon the diet than any other single factor, being high on a meat diet and low on a vegetable diet.[3] The hydrogen ion content as influenced by diet, therefore, is important and may play a considerable part in the formation of calculi.

When we realize the large amount of solids normally excreted in the urine during the twenty-four hours, a total of approximately sixty grams, we wonder why stones do not form in the urinary tract of every individual. Nature has provided an ingenious mechanism for the protection against encrustations in the urinary channels by means of the colloids. The presence of the colloids gives the urine a greater solvent power, enabling it to hold larger quantities of crystalloids in solution.[4]

The delicately balanced colloidal mechanism may easily be disturbed by faulty metabolism or by tissue alteration in the urinary tract. Normal urine contains *no* irreversible colloids; hence, ordinary deposits are readily dissolved. In the presence of an excess of crystalloids or a foreign crystalloid, as oxalic acid, cystin, or xanthin, the colloids are overwhelmed and a deposit will occur, forming a nucleus for a calculus. Qualitative and quantitative changes may occur in the colloids with consequent stone formation. In some instances there may be specific stone-forming colloids at work. The recent work of Rosenow, in which he produced evidence of calculus formation with certain bacteria, indicates that specific bacteria produce specific stone-forming colloids. Inflammatory exudates may contain pathological colloids which, on entering the urine, will disturb the protective action of the normal colloids and lead to stone formation. Not every abnormal colloid introduced in the urine will cause crystalline deposit. If this were true every case of infection in the kidney or ureter would show a stone.

Aschoff and Kleinschmidt claim the majority of calculi begin as primary calculi, formed independently of inflammation, but from an excess of the main constituent of the calculus. Ransohoff, in corroborating their work, found primary calculi to consist of uric acid, urates of sodium and ammonium, calcium oxalate, cystin and xanthin, deposited without changes of an infectious nature. These investigators found secondary calculi composed chiefly of ammonium and magnesium phosphates, calcium phosphate and calcium carbonate, developing in the presence of infection. In other words, primary calculi are of non-bacterial origin, while secondary calculi are of bacterial origin.

Crystallization is dependent upon (1) a defective metabolism; and (2) an abnormal composition of the urine. In the urine there may be an excess of the substances normally held in solution, a diminution or absence of substances capable of holding others in solution, or a foreign substance acting as a precipitating agent; (3) changes in the hydrogen ion concentration due to an unbalanced diet, or ammoniacal fermentation; (4) qualitative or quantitative changes in the colloids. Merely finding a precipitate in the urine is not sufficient to assume the patient has a stone. An examination after an attack of renal colic may show "showers" of calcium oxalate crystals which may persist a short time and clear up. The explanation is that through a disturbance in one of the above factors the equilibrium between the solvent and the solute is upset and calcium crystals are deposited. Later, the equilibrium is re-established and no more crystals are found. Likewise, phosphatic deposits can occur but the acid tide of the urine may rise sufficiently high at some time in the twenty-four hours to re-dissolve all of the deposits.

Concretions apear to form according to a rather definite law.[4] There is always a nucleus upon which the crystals are deposited. The nucleus may be crystals from an over-saturated urine, massed cells or bacteria. Upon this nucleus substances crystallize out of solution in much the same manner that rock candy crystallizes about a string with the important exception that mucin is deposited. Mucin acts as the cementing substance, binding the crystals to the nucleus. The calculus thus begun increases in size as long as mucin is deposited to hold more crystals together. Calculi are admixtures of organic and inorganic material.[5] The most common constituents of calculi are uric acid, calcium oxalate and the phosphates.

Uric acid is a common, though probably not as often the predominating, constituent of calculi as was formerly thought.[6] Uric acid is difficult to hold in solution and is more soluble in a weakly acid medium. Formation of uric acid concretions then is favored by the high acidity of the urine, by increased ingestion of

proteins from which uric acid is derived, or by high percentage of acid phosphates which tend to lower the solubility of uric acid. Excessive catabolism of nucleated body cells, as in leucocytosis of inflammatory diseases and leukemias, increases uric acid formation.

Calcium is taken into the body in an inorganic form. Calcium is more soluble in acids. The amount absorbed depends upon the condition of the gastro-intestinal tract.[7] Calcium metabolism is well stablized; a large proportion of its salts is eliminated by the bowel. Consequently, feeding large doses of calcium or giving it intravenously does not increase to any extent the amount in the urine. Although adults possess a tendency to calcium equilibrium, individuals who have taken large quantities of milk and vegetables rich in calcium for a long time have shown calcium calculi. Calcium oxalate and calcium phosphate are difficult to hold in solution. A number of physical chemists, including Schaede, Bechhold, and Lichtwitz, claim that the colloids play a great part in holding these salts in solution. Lichtwitz showed that the extraction of colloidal material from the urine with benzin resulted in a precipitate of the phosphates and that when dialyzing the urine against water the urinary crystalloids passed into the water and precipitated. The precipitate consisted chiefly of calcium oxalate.

Authorities state that the oxalate in the urine is derived from an imperfect metabolism of oxalic acid. The excess oxalic acid is thought to be due to an incomplete oxidation of carbohydrates, or to fermentation of the carbohydrates in the gastro-intestinal tract. The acidity of the gastric juice is a factor in calcium metabolism. The exogenous source of oxalic acid depends upon the ingestion of certain foods rich in calcium, such as cabbage, rhubarb, tomatoes, beet-root, French beans, asparagus, strawberries and figs. Ord found certain forms of calcium oxalate crystals tended to remain isolated, while others tended to coalesce. In the non-coalescent type the crystals may be deposited but no concretions form, while the coalescent type may readily form stones.[2] Clinically, we are unable to distinguish between the two varieties.

Phosphorus is taken into the body in the forms of phosphoric acid and phosphates, and exists in the body as salts and esters of orthophosphoric acid. The extent of absorption depends upon the reaction of the gastro-intestinal tract and the concentration of calcium and magnesium ions present.[7] Phosphorus is excreted as phosphates. Phosphoric acid plays a large part in maintaining the acid reaction of the urine. The disodium phosphate is taken from the blood by the kidneys and is changed into monosodium phosphate which dissociates and gives the urine its acid reaction.

Precipitation of the phosphates, calcium carbonate and ammonium urates occurs in neutral or alkaline urine. The alkalinity may be due to bacterial decomposition. This is the most frequent cause of deposits in urine which has stood after voiding.

Phosphaturia in the absence of an infection, is probably a metabolic disturbance. Fixation of alkalies in the body or increased loss of alkalies may produce it. Ammonia may be split off from the urea immediately after excretion by the kidneys, rendering the urine alkaline as in the case of an alkaline urine produced on a prolonged meat diet without administration of alkalies. Depletion of chloride ions from constant vomiting or gastric anacidity may give rise to phosphaturia. A person may not empty the bladder promptly after it has filled, and calcium carbonate may be precipitated with fusion of the crystals.

Cystin calculi are very rare and of much interest. Cystin occurs in the protein molecule along with other amino acids. Its presence in the urine is significant of imperfect protein metabolism. Where the error lies is not known, though it is thought to be due to defective catabolism. Alkaptonuria and cystinuria have been found existing simultaneously. Wolff, Osterberg, Shaffer and Somagyi found other anomalies in these urines, such as low ammonium, high nitrogen and high neutral sulphur.[7]

Has the physio-chemical basis of stone formation a practical application in therapeusis? In the present state of our knowledge we cannot say how much may be accomplished. Working on this basis, however, and at the same time not overlooking any associated infection or any other possible contributing element, we believe a great step forward will be made in averting the formation of a primary calculus in conditions believed to be precursors of calculi and in preventing recurrences in patients who have had calculi. Since the conventional methods of treating lithiasis

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have proved inefficacious, our attention is forcibly brought to the necessity of revising our therapeutics, and a revision in the direction herein indicated would appear to offer some prospect of happier results.

The most important phase of this treatment is prophylaxis, which should endeavor (1) to prevent precipitation of crystals from the urine; (2) to prevent a concretion forming when crystallization has occurred by removing the crystals as quickly as possible; and (3) to prevent the necessary binding substance from being present.[8]

The *prophylactic treatment* requires a knowledge of the composition of the stone in the patient who has already exhibited a calculus, and of the urinary precipitate in the patient who, though not yet the producer of an actual calculus, is apparently presenting a diathesis likely to eventuate in stone formation. This knowledge may be acquired by studying the crystals found in the urine; by a chemical analysis of the stone if voided or removed by operation; and by determining the hydrogen ion concentration of the urine. Presuming that these essential data have been obtained, further consideration of the question of prophylactic therapeutics will be found to be concerned chiefly with the matter of diet and drugs. As the acidity of the urine is dependent on the diet and as the foods ingested must be metabolized and excreted, therefore, the diet will receive the greatest consideration. Medicinal agents will prove of secondary importance but are entitled to some attention.

The dietetic indications in *uric acid calculi* are for a mixed diet with a preponderance of vegetables, fats and carbohydrates and low proteins.[7] Such a diet will tend to prevent the urine from becoming too acid and at the same time obviate an excess of uric acid in the urine. Sweetbreads, kidneys, brains, liver, and fish-roe are especially rich in nucleic acid from which the purin bodies are derived and should be prohibited. Spinach, green peas and beans should not be given for the same reason. The diet may consist of cereals, cream, milk, whey, butter, cheese, eggs, gruels, meat soups, cheese souffle and Welsh rabbit, vegetable soups and salads, macaroni, rice, hominy, tomatoes, rhubarb, corn, cabbage, cauliflower, asparagus, carrots, parsnips, potatoes, turnips, squash, celery, honey, tapioca, syrup, buckwheat cakes, wheat bread, cornbread, toast, Graham crackers, fresh or preserved fruits and the usual nuts.

After the patient has been on a purin-free diet for several months, a limited amount of white meat may be given at the midday meal two or three times a week. Later, the meat days per week may be slowly increased. It is well to remember that broiled or roasted meat increases the uric acid output more than boiled meat, for in boiling purins are extracted.[9] Hence, an individual with uric-acid diathesis should eat meat prepared by boiling, and then not more than 70 grams may be taken.

The protein-low diet should not be abandoned even though the patient is not exceeding the uric-acid tolerance on the amount of meat allowed.

Medicinally, alkalies are useful in diminishing the urinary acidity and occasional doses should be given, especially if the acidity increases.

Oxaluria, phosphaturia, and cystinuria may be precursors of calcium, phosphatic and cystin calculi and must be considered in the treatment of these types of calculi. While there are no statistics to show the frequency of stones in these conditions, we must regard persons showing one of them as potential stone patients, and subject them to the same prophylactic treatment. Phosphaturia, however, has less significance than the other two, but where it persists it is an abnormality.

Oxaluria and Calcium Calculi.—In prescribing a diet low in calcium we should increase the food that will produce high urinary acidity. Peas, lettuce, rice, cauliflower, carrots, wheat, oatmeal, corn flakes, eggs, milk, fish, oysters, bacon, ham, chops, steaks, fowl, stale bread, or toast and fruits, except those with high calcium content mentioned above, will be useful. Plums, prunes, and cranberries are especially good for increasing the acidity. Milk and eggs should be taken in moderate quantity. The diet should be low in carbohydrates and fats to prevent fermentation. In treating oxaluria we must pay proper attention to the gastro-intestinal tract as well as to the condition of the urine.

Medicinally, hydrochloric acid or nitrohydrochloric acid should be employed, though the acid should not be continued too long as the high acidity and increased meat ingestion may bring about precipitation of other crystals. Sodium phosphate is said to have a tend-

ency to hold calcium in solution in the urine. If constipation exists it will be useful in two ways.

Phosphaturia and Phosphatic Calculi.—In all cases of phosphaturia a correct diagnosis of the cause must be made or the treatment will be unsatisfactory. When the phosphaturia is of an exogenous source the dietary will play a large part in changing the urine from an alkaline to an acid reaction. We may allow the sea foods, meat, milk and eggs in small quantities, thus holding the protein intake to a minimum. A large carbohydrate allowance should make up the balance of the diet. Cereals, cream, whole wheat bread, rice, crackers, all vegetables, all fruits and the ordinary nuts should be eaten freely. Alkalies and alkaline waters must be prohibited.

When of endogenous origin, manifestly the diet will be of little importance. The general considerations of the patient as to curtailment of wear and tear to which he has been subjected, and instructions for a greater amount of rest must be given. As phosphaturia may occur in neurotic persons, the psychic element must be considered. All digestive disturbances must receive proper treatment.

Medicinally, the urine should be acidified by the aid of mineral acids. Sulphuric acid in the form of sulphuric acid lemonade, ten to fifteen drops of the acid in sweetened water, is prescribed by some clinicians. Sodium acid phosphate in large doses is prescribed. The benzoates and benzoic acid may counteract the alkalinity and, in the presence of infection, may exert an antiseptic action. Van Noorden administered Mist. Creta grs. xv-xxx, two or three times daily, to aid elimination of phosphates by the bowels.[9]

As phosphatic calculi are usually secondary, the result of infection, the infection in any part of the urinary tract must be treated. This type of calculus is more frequently found in the bladder, but it may also be found in the renal pelvis.

For cystinuria and cystin calculi, an alkaline urine is necessary. The individual should eat sparingly of proteins. The meat proteins particularly should be interdicted. Looney, Burgland, and Graves found that eggs added to the dietary increased the cystin excreted by patients with cystinuria.[10] The dietary may consist of cereals, cream, butter, one or two glasses of milk, two or three slices of bread, one piece of breakfast bacon, vegetables, except spinach, green peas and beans, vegetable soups and salads, honey, tapioca and nuts, and fruits, except plums, prunes and cranberries. An alkali should be given daily, and, later, three or four days a week. Cystin is more freely soluble in ammonia than other alkalies, hence, ammonium carbonate is the drug of preference.

We do not believe the constituents of the various mineral and lithia waters, much vaunted in the past, have any special action in preventing stone formation. The psychic effect produced on the patient causes him to drink large quantities of water when an equal amount of ordinary water will probably do as much good. Distilled water was recommended by Ochsner and others. It may be efficacious in localities where hard water prevails, but in this section we do not know of any particular value to be derived from its use. Patients showing crystals in their urine, or who have had a calculus, should drink large quantities of water to dilute the urine and flush out the urinary tract.

Can a calculus be dissolved after it has formed? We are unable to answer this question. If the nature of the stone can be ascertained, the institution of proper corrective measures may limit its growth. By limiting or preventing irritation by the stone, thereby reducing the production of mucin, the growth of the stone may be halted. If the mucin already in the stone could be dissolved, the stone itself would fall to pieces. A purely crystalloid stone, which is a type rarely seen, may redissolve, but the mixed variety, composed of colloids and crystalloids, presents a difficult problem in that the colloids are irreversible and prevent redissolving. When we learn more about the colloids, greater light will be thrown upon this question.

Conclusions

1. The basis of calculus formation in the urinary tract is probably physio-chemical. The factors concerned in the formation are (1) faulty metabolism; (2) a change in the hydrogen ion concentration of the urine; (3) disturbance in the colloidal mechanism.

2. Infection and stasis are probably only occasionally of primary importance and are usually contributing factors in calculus formation. They favor the stone forming mechanism (1) by changing the reaction of the

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urine; (2) by the bacteria serving as a nucleus.

3. Therapeusis is concerned chiefly with the prevention of the reformation of calculi; or of the development of calculi in individuals exhibiting a stone diathesis. The treatment consists in correcting anatomical and metabolic irregularities, and clearing up infection where it exists.

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Stuart Circle Hospital.

SOME CONSIDERATIONS REGARDING PROSTATISM.*

By R. M. LeCOMTE, M. D., Washington, D. C.

In casting about for a subject on which to base my remarks for this occasion, I was rather perplexed to find one that would hold an interest for all of you. During the summer, I talked with three active Washington physicians and these conversations led me to believe that I might present to you a study of some of the aspects of what we call prostatism or enlargement or hypertrophy of the prostate gland. The first conversation was with a general surgeon who told me that he removed every bit of glandular tissue from the prostatic capsule when he did a suprapubic prostatectomy; the second was with an urologist who had no doubt but what every prostatic adenoma sprung from the lobes of the preformed adult prostate gland; and the third was with a very keen internist who said that he believed both of these statements to be true.

The opinions of these three active and intelligent medical men were at variance with the ideas that I had long held on the possibility of removing the prostate entirely and also as regards the origin of prostatic adenomata, so that I began to wonder whether or not I myself might not be wrong. Accordingly, I reviewed my notes, worked for a while in the Library of the Surgeon-General, decided that I had been right in the first place, and concluded to use this work as a part of the material for my Presidential Address to you.

By prostatism is meant the symptom complex which develops as the result of obstruction to the outflow of bladder urine, due to changes in the prostatic urethra. Clinically, it is characterized at its inception by frequency of urination, mainly at night, without retention; later, there is added to this incomplete bladder retention with perhaps periods of acute complete retention; finally, complete retention supervenes and catheterization is necessary. Various complications, mechanical and infective, occur during the course of the disease. Pathologically, the obstructing masses consist of tumors in or about the prostatic urethra and presenting the cytology and morphology of prostatic tissues; they range from a purely glandular to purely fibrous masses in the benign type; the malignant type is a characterisic adeno-carcinoma. In 100 prostates examined, Albarran and Halle (*Ann. des. Mal. des Org. Gen-Urin.*, 1900, 18, 112) classified the types found as follows:

Purely glandular	32
Mixed fibrous and glandular	51
Purely fibrous	3
Adeno-carcinomata	14

Of the fourteen malignant tumors, the malignancy had not been suspected either clinically or from the naked eye appearance in eight.

Prostatism is of relatively frequent occurence after the age of fifty years. Motz and Perearnau found the adenomata that comprise the essential lesion of benign prostatism in thirty of fifty-nine prostates obtained postmortem from subjects over fifty years in whom the prostatic disease was apparently not operative in producing death. We find it occasionally, apparently in a latent form, in the routine examination of men suffering from

*Read before the Washington Medical and Surgical Society, October 27, 1924.

other genito-urinary disorders. In the first 1,000 genito-urinary histories that I have, it was noted in 50 instances (5 per cent not corrected for age or sex), but only sufficiently well marked to require operation in 13 (26 per cent).

Anatomy

In the adult, the prostate is perhaps best described as a collection of simple and branched tubules with dilated extremities embedded in a fibro-muscular stroma.

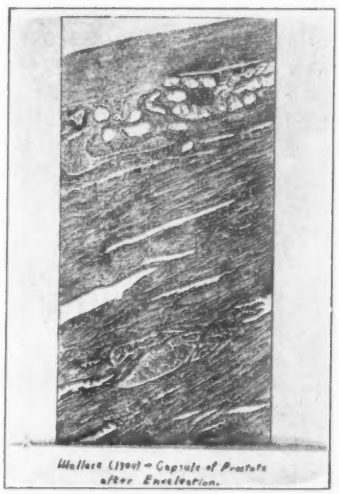
With the subject in the erect posture, the apex of the organ is directed downwards and the base upwards so that the prostatic urethra has an almost vertical course. This may seem self-evident when one looks at the sagittal section, but it is not so well appreciated in the clincal examination with the patient bent forwards, on his back, or in the exaggeraten lithotomy position.

The urethra and ejaculatory ducts traverse the prostate, dividing it into the different lobes that are described. The urethra enters at about the center of the superior surface and passes out at the apex. The ejaculatory ducts enter at the junction of the superior and posterior surfaces, in the longitudinal groove which is present on the latter, and pass in a straight line to the posterior wall of the urethra at about its mid-point, each discharging by a separate opening at the colliculus seminalis. The portion of the gland lying in the acute angle between the ejaculatory ducts and the urethra is termed the median lobe; its ducts empty into the urethra proximal to the colliculus. That portion lying behind the urethra and the ejaculatory ducts, in the obtuse angle formed by their junction, is called the posterior lobe or commissure; when present, its ducts empty into the urethra distal to the colliculus. On each side of and anterior to the urethra are the lateral lobes; their ducts empty into the urethra at the sides of the colliculus and they form the main mass of the prostate. The anterior lobe may appear between the two lateral lobes in front of the urethra, or may, and generally does, fail entirely; when present, the ducts empty onto the anterior wall of the urethra.

The stroma of the gland consists of fibro-muscular tissue. The muscular fibres are generally of the smooth variety, but in the apex in the region of the external urinary sphincter striated fibres are present. The gland has a fibro-elastic tissue capsule which is distinct from but intimately adherent to both the stroma of the gland and the surrounding muscular and fibrous tissues, notably the pelvic fascia, rectum, and the levator ani and external urinary sphincter muscles.

Embryology

About the third month of foetal life, several groups of epithelial buds appear as off-shoots from the urethra or urogenital sinus in the region of the openings of the Mullerian and Wolffian ducts; they penetrate into the mesoderm at that point. Detailed embryological studies show that there are at least five of these groups present, one for each of the five lobes described for the adult gland. Lowsley (*Amer. Jour. Anat.*, 1912, xiii, 3, July, 338) has demonstrated that they all persist until birth. The group for the anterior lobe must



generally disappear between birth and adult life for it is exceptional to find it in the adult gland. That the group for the posterior lobe persists after birth and remains in the adult gland as a separate group having their own excretory tubules is open to question. It is probable that the tubules of the posterior lobe are not constant but that they are present in the majority of adult glands. Lowsley was able to demonstrate in the foetus rudimentary periurethral glands corresponding to those described by others in the adult gland.

But little is known of the changes that occur in these prostatic glands between birth and puberty. Such work has apparently not in-

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terested anatomists and urologists much for scarcely anything has been written upon it. So far, I have been able to find only two descriptions of detailed studies of the morphology of the gland, both done in new-born infants. Like other sexual glands, it must have a rather definite metamorphosis during this period of sexual ripening. Castration in infancy or early in childhood leads to an aplasia or atrophy of it.

The first point that I wish to take up is that of the possibility of complete removal of the prostate. This can be done by an operation, either suprapubic or perineal, in which the urethra is cut across and the attachments of the gland capsule to the surrounding soft parts is severed; it cannot be done safely by finger dissection and is only done for adenocarcinoma. In the suprapubic enucleation of benign growths, the usual procedure is to cut or scratch through the bladder or urethral mucosa with the finger, establish a line of cleavage between the tumor and the capsule and enucleate as much tisssue as is possible without tearing the capsule itself. This gives the impression that the entire prostate has been removed. That this is not true is shown by the fact that rectal examination after prostatectomy reveals a very definite prostate of normal size. In 1904, Cuthbert S. Wallace (Pathological Society Transactions, London, 1904, 55, 255) showed that glandular prostatic tissue remained in the capsule after the enucleation operation, and that what Freyer had called a total prostatectomy was in reality only a partial removal of the gland. Later, Freudenberg (*Verhandl. d. Deutsch. Gesellsch. f. Urolg.*, 1909, ii, April, 475) reported the findings on microscopic examination of the wound bed in three cases that had died soon after operation.. In each of these, the colliculus seminalis was present and glandular prostatic tissue was discernible in the capsule of the prostate left after operation. He concluded that a total prostatectomy was impossible.

An understanding of what I believe to be the genesis of the tumors that make up the enlargement in benign prostatism depends on recognition of the work of Albarran and Motz (*Ann. des Mal. des Org. Gen.-Urin.*, 1902, 20, 769). Their studies showed that the prostatic glands were divided into two groups, a central and a peripheral one, separated by a more or less well-defined muscle layer which they termed the intraprostatic sphincter. The central group lies immediately beneath the urethral mucosa, along the entire length and circumference of that tube. They are best developed on the posterior wall where they form two main collections, one at the level of the colliculus, termed the submontanal group, the other, encroaching upon the urethra or vesical neck, between it and the mucosa, and termed the subcervical group. The peripheral group makes up the prostate proper, forming an almost complete girdle of the urethra and central glands in the middle of the region but being deficient anteriorly at the vesical neck and at the apex.

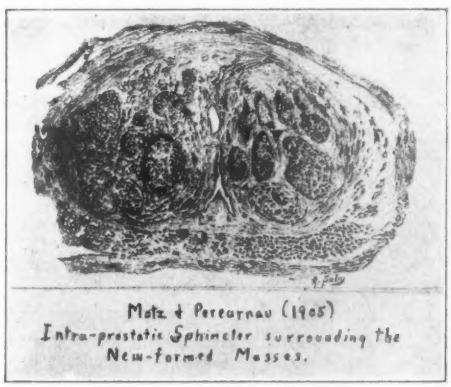
A critical study of the literature and illustrations of the glands in the prostatic urethra impresses one that the different glandular groups described by Rokitanski (1861), Henle (1873), von Jores (1894), and Ribbert all really fall into the category of the group now commonly referred to as the central glands of Albarran. Such differences as occur in the descriptions and illustrations may very well have been due to individual differences in the specimens examined. The latest authors to take up this point, Tandler and Zuckerkandl (*Studien zur Anatomie und Klinik der Prostatahypertrophie*, Berlin, 1922) apparently consider all central glands as rudimentary prostatic glands.

The view that the intraprostatic muscular tissue described by Albarran and Motz is really a part of the sphincter mechanism of the bladder has received affirmative support by recent X-ray studies of the posterior urethra by Burden (*Surg., Gynec., & Obstet.*, 1924, xxxviii, 3, March, 403). He found that the X-ray shadow of the posterior urethra was always just a narrow strip and could only be obtained by making an exposure while opaque fluid was flowing through it, and that, in normal individuals, no funneling of the prostatic urethra occurred when the bladder was overdistended and the desire to urinate was imperious. These studies indicate that the muscles of the prostate have a function in retaining urine in the bladder and that the time-honored idea that the internal sphincter relaxed, making a funnel of the posterior urethra when the bladder was over-distended, is not correct. Funneling was only obtained in some cases studied after prostatectomy when it was

reasonable to suppose that there would be some disturbance of the internal urinary sphincter.

In 1905, Motz and Perearnau (*Ann. des Mal. des Org. Gen.-Urin*, 1905, 23-2, 1561) reached the conclusion that hypertrophy of the prostate was produced only from the peripheral glands and the stroma which surrounded them, and that the prostate proper (the peripheral glands) took no part in the formation of the neoplastic masses, but were pushed to the side and backwards. This statement seems to have been justified by the specimens which they illustrated. Other workers (Marquis, Lendorf, Marion, Papin and Verliac) soon confirmed this idea. Tandler and Zuckerkandl, who formerly stated that the adenomata developed from the preformed median lobe exclusively, now state they think that the origin is in the rudimentary prostatic glands lying between the colliculus seminalis and the bladder neck; they state that the rudimentary glands which they describe differ from the central group described by Albarran and others, but do not present convincing evidence of the difference. From the prostatic urethra, the tumor masses develop upwards and forwards, either extending through the orifice of the internal sphincter, forming an intravesical tumor and deforming the normally dimple-like internal urethra orifice, or, pushing the internal sphincter before them, elevate the entire bladder floor without any marked distortion of the internal urethral orifice.

On anatomic grounds it would seem fairly certain that the adenomata spring from the central glands of Albarran rather than from the peripheral group which constitute the main mass of the adult prostate gland. Other findings, which are so much a matter of common knowledge and observation that they need not be considered in detail also support this view. Thus, it is a matter of common observation that the large purely glandular tumors are the ones most easily enucleated. This would hardly be true if, to gain access to them, the finger had to penetrate through a layer of fibro-muscular tissue, as it would have to, did the tumors arise in the peripheral group of glands. In post-mortem examinations, and it is only in such that an adequate idea of the exact relationships of the tumors can be gained, the ejaculatory ducts are never found involved in the new formations; they are not removed in the enucleation, as is shown both by post-mortem examinations and by the fact that the sexual function is not disturbed by the operation in men sexually active previously. If the tumors were to arise from the prostate itself, the ejaculatory ducts would seldom be spared either in the growth of the tumor or in the enucleation. Recurrence after operation is very rare; it is more common after the conservative perineal operation, in which endeavor is made to preserve the urethra, than it is after a suprapubic enucleation. In the latter the urethra above the colliculus is almost invariably removed with the tumor, either by accident or design, thus taking away what we consider to be the tumor forming glands. The pathologic lobes always grow towards the urethra and never towards the rectum, a circumstance which we would expect to occur at least once in a while did the new formation originate in the peripheral parts of the gland. It is not logical to state that the preformed adult prostate can never give rise to adenomata, but it is rational to say that it seldom does and that an instance in which it has has never been completely demonstrated.



Motz & Perearnau (1905)
Intra-prostatic Sphincter surrounding the New-formed Masses.

The importance of this question of origin runs in connection with the type of operation that is advisable to cope with the disease. Recurrence is not sufficiently frequent to determine this point. If the tumor is intravesical, there is no question but what the suprapubic route is the logical one; even the most enthusiastic advocates of perineal prostatectomy advocate and practice suprapubic operation for vesical tumors near the trigone and for plastic operations on the neck of the bladder in the male. When the tumor is subvesical, the perineal route may be urged on the basis that a

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rapid dilatation of the internal vesical sphincter will injure some of its fibres and cause urinary incontinence. That this is a sufficient reason for the perineal operation is doubtful, for, in it, muscles that are much more important at the apex of the gland are invariably torn and frequently give rise to some permanent dribbling. Ideal conditions would make a one stage suprapubic operation advisable so that the prostatic urethra down to the ejaculatory ducts could be removed under visual control; however, we seldom meet ideal conditions in old men suffering from prostatism, and generally have to content ourselves with a blind enucleation, which usually gives satisfactory results, after our patient has been prepared by more or less prolonged suprapubic drainage. The same effects may be obtained by intermittent or continuous catheterization when this can be maintained. There are objections to it, however, in that the urethra is traumatized, and infection may be increased and thus defeat some of its aims.

Another feature that I wish to take up with you is the importance of having a microscopic study of all prostatic specimens removed. During the summer I removed an adenoma weighing about twenty-three grains and only about 1.5 cm. in length, but which was situated just back of the urethral orifice where it would give a maximum of trouble. Clinically, the case, although in complete retention, would not make one suspicious of a malignant prostate and the gross specimen would not make one think of cancer. Microscopic examination showed a carcinoma in an adenoma. This might make us conclude that the carcinoma developed from the adenoma but we cannot be sure of that for it may have originated in the posterior lobe, as it usually does, and have then infiltrated the adenoma. Geraghty (*J. H. Hosp. Rep.* 1906, 13) found that, while thirty-eight of fifty prostatic carcinomata that he examined were also adenomatous, in all but one of these the posterior lobe was cancerous too. Any operation which leaves the posterior lobe in place will not prevent cancer from developing later.

Washington Medical Building.

"Father fell upon the ice
Because he could not stand;
Father saw the Stars and Stripes
We saw our Father-land."

—*Selected.*

"COME OVER INTO OUR VILLAGE AND HELP US."

By A. B. GRUBB, M. D., Cripple Creek, Va.

Two thousand years ago St. Paul received an urgent appeal to "come over into Macedonia and help us" and I believe he responded to the call.

Just now in the small towns, the villages and rural communities of Virginia there is a Macedonian cry to the physicians of our cities (where there are more than necessary) "to come over and help us."

There are about two thousand five hundred physicians in Virginia, many of whom are specialists, and this number can easily do all the practice in Virginia but they should scatter out. Virginia does not suffer from a shortage of physicians, but from a lack of equal distribution. The State Board of Health has done valuable service in showing the counties lacking medical service, and both our State schools should actually help locate their young graduates where they are most needed. For instance, Richmond, Norfolk, Roanoke, Petersbury, and Portsmouth could do on say three hundred and fifty doctors less than they now have. These, if located in some of our rural districts, could render a greater public service, could themselves be happier, could live cheaper, and in short could solve the bread and butter question more easily, enjoy more fresh air, the open spaces and have more prestige, etc.

Their children could grow up with less danger from street accidents, tubercular infection, and probably other infectious diseases. In some communities there is a chance for a doctor to have immediately a population of fifteen hundred or more to draw from and he may not have over three hundred to draw from in his city practice.

It is possible for him to have in his new location from forty-five to one hunded obstetrical cases, a few lobar pneumonias, many abscesses, few toxic goiters, several bronchial pneumonias, one hundred cases of diarrhea in small children, several acute abdomens, and hundreds of grippes, colds, all in one year. So he will possibly see three times as many patients who are actually sick as he has been accustomed to in his urban practice. Then too, he will become more versatile, have a richer clinical experience, have greater self-confidence and poise than his city brothers.

There is in every real medical student an innate desire to be of real service, to administer to those who are actually sick, and to be placed where his skill is needed. To find this place a village or town distant from the railroad is the ideal spot. The next best place is a small railroad town, then a town of two thousand, and finally, Richmond with her four hundred doctors already located would appear to offer the poorest opportunity for every young graduate. And yet, an "insidious propaganda" is put before young graduates to induce them to locate there, and in other already overcrowded cities. This "propaganda" runs as follows: "You are brilliant, you have a wonderful personality, you have social charm, there is always room on the top. Dr. Doe is fifty-five and will soon drop out and you can replace him." The young graduate is very susceptible to flattery and (unlike the chiropractor) has not been trained in college where to locate and many other things about the business of medicine. He is just as apt to locate in a place with a physician to every four hundred people as in one with one to every two thousand. There he expects to get on the top and stay. Once located his bull dog tenacity holds firm. He soon has a few admirers. To leave them would seem like defeat, so it would be better for him to be properly located at first. A member of the faculty should advise him or else each school should have a "chair on location" of graduates.

While this article has mostly had to do with the general practitioner, yet the same opportunity for specialists to find lucrative fields exists. A circuit of villages can be visited at regular intervals and they too can widen their horizon by seeing more who actually need them than by remaining cooped up in their city offices meeting stiff competition.

When even the head surgeon of a great hospital dies his associate steps in and fills his place. The leading physician of a great city passes and there are several ready to take his place. Trained technicians often take the place of medical graduates who work in laboratories and other special fields, but when the country doctor passes no one is ready to fill his place and thus a whole community suffers.

So, while I have not endeavored to show to my urban readers that a pot of gold exists at the end of the rainbow, yet a golden opportunity for service does exist and he who chases this will not be disappointed.

OCCASIONAL CAUSES OF FAILURE IN REGIONAL ANESTHESIA FOR HERNIA OPERATIONS.

By EDWARD M. HANRAHAN, Jr., M. D., Baltimore, Md.

It may be taken for granted, I believe, that with ideal regional anesthesia, hernia operations may be performed quite as satisfactorily as under general anesthesia. Nevertheless, there are several factors which, when not provided for, reduce an anesthesia from the ideal to the level of the satisfactory; and a merely satisfactory anesthesia is actually very unsatisfactory, both for the patient and the operator. By ideal anesthesia I mean the condition obtained when the patient is mentally composed and confident in the method and the operator; the muscles relaxed to a degree unknown with ether,—a relaxation comparable to that seen in the fresh cadaver. With the anesthesia often described as "satisfactory," the patient may be nervous and apprehensive, unable to discriminate between pain and touch, with his muscles reacting defensively against trauma. No wonder that operators who know only the latter anesthesia are dissatisfied with the method! And, furthermore, is not this the real explanation of the wide variation in opinion regarding its efficacy?

It is not my purpose in this paper to cite the advantages, both to patient and operator, of local over general anesthesia. It is sufficient to say that in many ways the successful use of local anesthesia is for the best interest of the patient. The only possible objection is that the operator's time is encroached upon, particularly if he makes his own injections. Finsterer, in Vienna, an ardent advocate of local, has for several years refused to operate on patients who insist on general anesthesia; his reasons being that his large experience with local anesthesia has accustomed him to a slow, careful and painstaking technique, the use of which would make an ether anesthesia too prolonged. But it is quite obvious that this meticulous work is decidedly to the patient's advantage when the ether hazard is eliminated. Not infrequently surgeons, unaccustomed to and not in favor of local anesthesia, find themselves in a position where it must be used. Their instrumentarium is liable to be

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insufficient, their technique awkward. And yet they are too apt to blame their failures on the method rather than on their own misuse of it. Ideal local anesthesia is obtained only by the surgeon who seriously desires to utilize every possible means of inducing and augumenting an accurate novocain injection.

Among the factors which, when neglected, reduce, and, when considered, increase, the efficacy of local anesthesia, are: the mental attitude of the patient, the proper equipment of syringes and needles, an accurate knowledge of nerve distribution, and a modified operative technique.

The attitude of the patient is necessarily based on either hearsay evidence or previous experiences with either local or general anesthesia. I usually find that a previous experience with ether renders the suggestion of local anesthesia very welcome. It is noticeable, too, that the number of patients who ask for local anesthesia is increasing, probably because this method is being used more frequently and with greater skill. Again, without any preconceived idea, the attitude of the patient is colored directly by that of the surgeon. Farr's statement is very true, that a patient who has sufficient confidence in a surgeon to be operated upon, certainly will be found to have equal confidence in his choice of anesthesia. But, when once a decision has been arrived at, there must be no half-way measures. If local anesthesia has been chosen, the surgeon will attempt to satisfy the patient's needs at every point of contact. The hospital staff of assistants, nurses and attendants must co-operate in his strict observance of detail. Nothing should be omitted which would serve to promote the patient's comfort and well-being. The confident patient has better control of himself and his interpretation of sensations is more reliable. He does not interpret as pain the various types of paraesthesia often encountered.

Preliminary medication is important only in nervous or excitable patients. Drugs should never be given with the idea of controlling pain during the operation. If this becomes necessary, the technique has been faulty. The giving of morphia (gr. 1/6) or pantopon (gr. 1/3) with scopolamin (gr. 1/300) an hour before the operation is a good routine practice before procedures which will probably last more than fifteen minutes. For shorter operations it is entirely unnecessary if the novocain block is accurate. In operations of half an hour's duration or longer, such an injection alleviates the mental strain which may develop even in the complete absence of pain. Whether or not it is necessary the surgeon must judge for himself on the basis of the patient's disposition and the duration of the operation. But I would emphasize that morphia and scopolamin are given for their effect on the patient's mental state, and never for any effect on pain. The latter must be prevented by novocain.

Next, we have to take into account the position of the patient on the operating table. The usual table is not comfortable for any one who has to lie in one position for an hour. The mattress should be at least two inches thick, and a great advantage is gained by relaxing the abdominal muscles by means of pillows placed under the knees, chest, the head and neck.

Iodine is irritating if allowed to come in contact with the genitalia or the inguino-scrotal junction and may be a source of marked discomfort to the conscious patient. Mercurochrome in alcohol and acetone, as suggested by Scott and Hill, is not irritating and is equally satisfactory for antisepsis. Acriflavine, 5 per cent in 50 per cent alcohol, has much to commend it.

The proper selection of syringes and needles is of the utmost importance. Small 2 c.c. syringes and short needles, which are suitable for the skin wheal only, are sometimes used for the entire injection. It is quite true that with this equipment an excellent anesthesia may be obtained, but it entails infiltrating layer by layer, sometimes before every stroke of the knife, after the older Schleich method. The field is usually flooded and edematous, and the surgeon handicapped. A syringe which holds 10 c.c. is neither so large as to be cumbersome nor so small as to need constant refilling. An eccentric tip and a simple lock nozzle are invaluable. The syringe designed by Labat meets all requirements. It is admirably balanced, will readily inject when parallel to the skin surface and may be detached with a half-twist from the needle when the latter is left in place. Needles should be pliable and unbreakable, and of sufficent length to infiltrate subcutaneously the entire line of incision.

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The novocain solutions are best prepared according to the proper strength immediately before operation. In a busy operating room it will be found convenient to keep a stock solution of 2 per cent novocain on hand. This may be diluted with normal salt solution as desired. Sterile distilled water is entirely unsatisfactory as a solvent for novocain, because its hypotonicity entails a marked edema in the operative field. For the occasional or emergency use of novocain there are on the market 50 c.c. ampules of sterile salt solution to which may be added sterile novocain to the desired strength. Most of the standard brands of novocain or procain are satisfactory. I have been most satisfied with the French product neocain, which is marketed in sterile capsules containing 0.5 gm.

The use of adrenalin is a great adjunct. It is given with only one object in mind, the concentration and delayed absorption of novocain in a given area. It is indicated when the amount of novocain solution needed to circuminject any field approaches the danger point, 1.5 gms.; or when the duration of the operation is so prolonged that the novocain solution will have been absorbed before the closure. Its hemostatic action makes a drier operative field, but this advantage is of doubtful value because of the capillary ooze which takes place later into the closed incision. The operator must use more careful hemostasis when adrenalin is given, and the drug should be omitted in patients who have toxic hyperthyroidism, diabetes mellitus or marked hypertension. A very convenient preparation is the 1 c.c. ampule of sterile synthetic adrenalin. Five minims are added to every 50 c.c. of novocain, but more than twenty-five minims should rarely be used. When it is necessary to restrict the dosage of adrenalin, it should be omitted from the subcutaneous injections rather than from the injections in the vicinity of the nerve trunks.

The fixation of towels and other drapings to the skin is best done with silk stitches. The usual towel clips pinch the skin too much and cause pain when in place for any length of time.

Local Anesthesia in Operations for Inguinal Hernia.—The details of the technique are described in such standard works as those by Labat, Braun, Farr, and others. The inguinal region is ideal for blocking, inasmuch as the nerve supply is fairly constant and variations may readily be controlled. I have been best satisfied with a combination of the Braun and the Labat technique, a modification which, following the Braun method for the subcutaneous injection, differs from it in making the transverse diameter of the rhombus a little wider, and follows the Labat method for the subaponeurotic and cord injections. Unanesthetized skin should be penetrated only for the initial wheal. Secondary wheals may be made without pain by the subcutaneous approach recommended by Farr. The injection of the ilio-inguinal and ilio-hypogastric nerves as they lie between the transversalis and the internal oblique muscles is usually accurately made through the para-iliac wheal. By keeping the needle in this wheal and injecting toward the umbilicus, descending fibers of the twelfth nerve are also anesthetized, and by continuing medially, 10 c.c. of novocain may be injected beneath the sheath of the rectus. For completeness, in order to reach branches of the intercostals which come off above the point of injection, the needle may now be gently inserted more deeply, along a line between the anterior superior spine and the umbilicus, and novocain injected into the subperitoneal space. This step is often avoided for fear of penetrating the peritoneum. As a matter of fact, if one injects as the needle is pushed forward, the peritoneum is detached by fluid, and accidental penetration becomes quite difficult. This may readily be demonstrated either on a fresh cadaver or at operation. In addition, even if the peritoneum be penetrated, no harm has been done unless the bowel is entered, and that also is difficult to accomplish accidentally. This subperitoneal injection is very important. It anesthetizes the sac and peritoneum about the internal ring, with the exception of that part which is supplied by the external spermatic branch of the genito-femoral nerve.

Through the para-iliac wheal, a long needle may be directed along Poupart's ligament down as far as the lateral border of the external ring. Novocain injected here and along the course of the needle will allow for error in the injection of the ilio-inguinal nerve, and for collateral branches of the lumbo-inguinal (a branch of the genito-femoral nerve) which sometimes curve around toward the lower border of the operative field.

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From the pubic wheal, a needle is introduced into and upward along the upper and medial border of the cord, and novocain injected about the external spermatic nerve as it curves upward into the internal ring. The injection, if constant, diffuses subperitoneally and there is little danger of injecting the deep epigastric vessels, which lie close to this point, just at the medial border of the internal ring.

Finally, I have noted that traction on the sac of a direct hernia will sometimes cause pain. This, however, may be avoided by a deep injection into and beneath the spine of the pubis, a fact which lends weight to the view that the innervation of this portion may be overlapped by fibers from the sacral plexus.

The surgeon who attempts to employ with local anesthesia some of the dissecting methods which he ordinarily uses with ether invites failure. Operative technique should be slow and painfully exact. Sharp dissection must replace tearing, and tissue planes must be found and followed more gently than by opening scissor-blades. The spermatic cord should be opened sufficiently to avoid all unnecessary handling of vas, nerves and vessels. Traction on the sac should be steady and constant rather than abrupt and intermittent. By sharp dissection the sac should be separated from the cord rather than the cord from the sac. Steady traction will permit a much higher ligation of the sac than is possible with an intermittent pull. The latter often causes pain, since it makes more demands on one of the most sensitive and often least anesthetized areas of the operative field.

In summary, then, the success of a regional anesthesia depends upon close attention to many small details, without which we can never be sure of a degree of anesthesia satisfactory for both operator and patient. As a reward for his meticulous care, the surgeon will obtain an anesthesia suitable for any operation, and he will have the satisfaction of seeing his repair undisturbed by the post-operative retching and vomiting usually seen after ether. *Severn Apartments.*

No one has ever added up
The value of a smile
We know how much a dollar is
And how much is a mile
We know the distance to the sun
The size and weight of earth
But no one here can tell you just
How much a smile is worth.

—*Selected.*

ENDOMETRIAL CELL INVASIONS.*

By A. L. STAVELY, M. D., Washington, D. C.

The invasion of various pelvic organs and structures by the epithelial cells of the uterine mucosa furnishes one of the most interesting subjects dealing with gynecological pathology. The enthusiastic and painstaking work of Cullen in regard to adenomyoma and the later work of Sampson about endometrial cell transplants have thrown a flood of light, which has dissipated speculation and clarified our knowledge.

As Frank says, he, Cullen, "has welded the subject of adenomyoma of the genital tract into a clinical and pathological entity, characterized by the presence of tissue, identical in histology with that of the uterine mucosa, partaking of its physiological function in regard to menstruation and possibly accounting for the possibility of the ovum to nidate ectopically."

Adenomyoma of the uterus, which is in the nature of an hyperplasia of the uterine mucous membrane and myometrium, is a growth, which is described very succinctly by Cullen as follows:

"The uterine mucosa is often of normal thickness and looks perfectly natural; but as we approach the underlying diffuse myomatous tissue, the mucosa is seen to penetrate it in all directions, sometimes as an individual gland, but often large areas of mucosa are seen extending into the depth. In favorable sections one can follow a prolongation half way through the uterus. Where the diffuse myomatous growth ends, the outward extension of the glands also ends." An adenomyoma of the uterus, in brief, shows these features,—a normal or hypertrophic endometrium, a local increase and hypertrophy of the unstriated muscle and fibrous tissues, a deep penetration of the muscles with glandular prolongations of the mucosa and the presence in the involved areas of cyst spaces, lined with uterine mucosa and containing old blood. It may occur as an individual condition or in association with fibroids. Two rather extensive surveys show its presence in the ratio of one to every six fibroids. Where they occur together in the same organ they may be found in entirely different parts, or small fibroids may be seen in the adeno-fibroma, or the latter may be found

*Read before the District of Columbia Medical Society, at Washington, D. C., February 26, 1926.

as a polyp in the uterine cavity. The growth may occur in any part of the uterus, but has an especial predilection for the posterior wall. In the diffuse form it can involve the whole organ or it may be found in one horn or any other part, or it may surround the whole uterine cavity like a magnified endometrium. It may occur in a rounded form like an ordinary fibroid; but it has no capsule and can not be shelled out of the substance of the uterus. It has a characteristic appearance and can be differentiated from normal uterine tissue.

As to etiology of adenomata and the various other aberrant endometrial growths to be referred to later, there are several differences of opinion which may be mentioned. Von Recklinghausen says the epithelial constituents of adenoma and cystadenoma of the fallopian tubes and of their interstitial portions and of the outer peripheral layers of the uterus are derived from rests of the Wolffian body, while the centrally located adenomata of the uterus arise from the uterine mucosa or its equivalent, the Mullerian ducts (1893).

Pick (1897) says the Wolffian body and duct on one side and the Mullerian duct on the other stand in such developmental relationship to each other that we must ascribe the origin of the epithelium in adenoma and cystadenoma to both sources. Again, adenoma of the round ligament and of the posterior vaginal wall are of paroophoron origin and are due to displaced distal rests of the Wolffian body.

Robert Meyer believes the most common source of adenomata is the uterine mucosa; but he believes with Iwanhoff that ectopic adenomata develop through a metaplasia of the cells of the peritoneum. Following some inflammatory process these cells undergo change, send shoots or buds into the uterine tissue and form canals with epithelial lining, characteristic of uterine mucosa. He presupposes an inflammation always and says the fact that these growths show a decidual reaction is not proof of Mullerian origin, as it may occur in inflammation involving the omentum and some other tissues.

M. R. Robinson, in looking for a cause, says, "What is the common genetic soil from which spring all endometrial growths? Since the coelomic epithelium is the structural source of the generative organs, any morphological phenomenon arising in the body during adult life, which simulates the uterus structurally and functionally, must of necessity be a derivative of the same embryological rudiment.

"What really takes place in the evolution of an extra-uterine endometrial growth is a topical awakening of the genetic potentialities in some of the unused coelomic rests through a sudden increase or the stimulating or through a diminution of the inhibitory genetic forces. And just as the coelomic epithelium is capable of heterotopic endometrial proliferation without having to be displaced from the primitive (or fully developed) urinary or genital tracts, so can and does the connective tissue in the vicinity of these glands undergo cytogenous metamorphosis identical with that of the urterus without the process of displacement." He ascribes the cause of adenoma to an excess of ovarian hormones rather than to inflammatory processes. Sampson believes the peritoneal growths are due to a regurgitation of endometrial cells through the tube during menstruation and their subsequent implantation in the various pelvic areas. This will be referred to more later. Recently a German investigator, Halban, in considering the origin of adenomata, advanced the theory that endometrial epithelium may invade the lymph vessels of the uterus and be carried to points as remote as the surface of the uterus and even involve the pelvic and inguinal glands. The fact that in chorioepithelioma metastasis may take place through the veins to distant points like the lungs, suggests the interesting possibility of the veins serving as the avenue of transmission in some instances.

The symptoms of adenomyoma of the uterus are not characteristic. The uterus may be considerably enlarged, but seldom reaches such a size as may be seen in some fibroids. The consistency of the uterus is softer than in ordinary fibroids and may lead to a mistaken diagnosis of pregnancy. There may be an increase and prolongation of the menstruation. Differentiation from a soft or degenerated fibroid may be difficult. While adenomata are benign, there is a certain incidence of malignancy, which makes surgery advisable.

In May of last year I saw a patient upon whom I had operated several years ago for ovarian cyst of the left side. Both the tube and the ovary were removed at that time. On a recent visit I found a large cyst of the other side and advised removal. It proved to be a cystadenoma of pseudomucinous type; but the

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particularly interesting feature was in the left horn of the uterus. The organ was soft and somewhat enlarged at the left horn, and embodied in the uterus was an enlargement the size of an egg. Thus, finding definite pathology, the uterus was removed also. This proved to be an adenomyoma, the exciting cause of its presence there probably depending upon some inversion of epithelial cells at the time the cornual stump was sewed over.

These remarks are introductory to a brief consideration of the further invasive properties of the endometrial cells into other tissues than the uterus and the tubes. Cullen has found them present in the following structures: body of the uterus, recto-vaginal septum, fallopian tube, round ligament, ovary, utero-ovarian ligament, utero-sacral ligament, sigmoid flexure, rectus muscle and umbilicus, and the appendix.

The growths involving the recto-vaginal septum are particularly interesting. Cuthbert Lockyear, of London, first called attention to this curious condition and his monograph, together with specimens sent to him by Jessup, of New York, stimulated in Cullen an interest which has resulted in a wide-spread knowledge of it in this country. He has reported experiences with an unusual number of cases. In the early stage the growth is apt to be unrecognized, unless the examiner is familiar with it. It first appears as a small nodule back of the cervix and in the vault of the vagina. It is quite firm to the touch and has a decidedly reddish or reddish-blue appearance. In the beginning there is no involvement of the surrounding tissues. The rectal wall is smooth and free and, if there is any indication of attachment anywhere, it may be to the cervix.

When first discovered it is generally from one to three centimeters in diameter, and forms a rather firm mass. In the more developed stage, or even before, there may be a similar showing in the posterior cul de sac. In most cases the rectal mucosa is not involved; in still more advanced cases we may find a spreading into the broad ligaments, compression of the ureters, involvement of the pelvic nerves, rectal infiltration and invasion of the vaginal wall. The pathological process is quite similar to that found in the uterus, non-striated muscular fibre, fibrous tissue and uterine mucosa, with here and there small cyst spaces filled with old blood and lined with uterine mucous membrane.

Symptoms.—Where the growth is small it is found by the merest chance in the course of a general examination. There is no intermenstrual bleeding. In the more developed stage there may be increase of pain during menstruation on account of turgescence in the mass and there may be a small increase in the amount of the flow, depending upon the size and number of the openings in the mass. During the time of engorgement there may be rectal bleeding, defecation may be attended with pain, and, later, when the growth has developed further, constipation and even obstruction. In the later stages the pelvic nerves may be pressed upon, causing constant pain, and the ureters may become blocked, with resulting hydronephrosis.

Diagnosis.—Inspection ought to furnish the greatest aid in differentiation. It may be mistaken for pelvic exudate, for adherent tubo-ovarian structures, for cancer and rectal growths.

Treatment.—We have a condition which is definitely invasive in tendency, and in a small percentage of cases carcinoma is found as a complication. Opinions as to treatment vary. Some think small growths may be watched and operated upon if they show a disposition to grow. Others are, or were, of the opinion that a thorough operation should be done. The rectum is sometimes seriously involved and an excision of the rectal wall or a resection may become a necessity. When surgery is impossible X-ray or radium may be tried, but without great hope of success.

Graves made a very interesting observation last year which offers a chance of relief in some of those cases that are not considered operative, and this may be found to have great value,—that is, the removal of the ovaries to bring about cessation of menstruation and atrophy of such growths. Graves' first case was a woman with a large fibroid uterus. Hysterectomy with removal of both ovaries was performed. Two hard tumors, one the size of a walnut, thought to be adenomata, were left at that time on account of dense adhesions to the rectum. Four and a half years later, another examination showed they had disappeared. In the second case there were several small fibroids and a blood cyst the size of a fist in the posterior cul de sac. These were re-

moved with difficulty. In the left parametrium was a dense infiltration with nodulation, which extended to the rectal wall. A year and a half after the operation the mass had disappeared. In a third case he found a large fibroid extending above the umbilicus and an extensive induration in the pelvis, which pressed upon and caused a bad stricture of the rectum. At operation, performed at a later date, he removed the uterus and tubes and ovaries and drained the bowel through a Mixter tube. At that time the rectal occlusion was almost complete. Five months later a distinct softening and diminution in the tumor was noted. Two months later she was in good physical condition, with normal movements accomplished with the aid of one dose of mineral oil a day, and the mass had undergone further diminution in size and hardness. Some similar reports have been made by others, though Cullen and others cite cases where no results were obtained after a double oophorectomy. These observations are very illuminating, and may lead to radical changes in methods of treatment.

Some few years ago I was asked to see a patient of Dr. Clark's, a woman 30 years of age, who had menstrual discomfort and some other symptoms suggestive of pelvic trouble. Without going into extensive details, it will suffice to state that through a vaginal speculum a small cervix was seen, and back of it in the posterior fornix was a reddish-blue mass about 3 centimeters in diameter, firm and not tender. Examination with the finger through the rectum revealed a tumor the size of a walnut, distinctly rounded and circumscribed, and not involving the rectum. An operation being determined upon, an attempt to remove it through the vagina was essayed, but abandoned on account of virginal conditions, and the abdomen was opened. After placing her in the Trendelenburg position, and after packing off the intestines, a reddish-blue mass was seen, presenting exactly the same size and appearance as was noted in the vagina. Finding no evidence of extension, I tried simple excision, but during the process a severe hemorrhage developed, which was controlled with difficulty. She made a good recovery and had no recurrence.

Another case, Mrs. L. D. K., of Hagerstown, age 35, had been a patient of Cullen's in 1907, when he operated during the early months of pregnancy and removed a pedunculated fibroid three or four inches in diameter. In 1915 she came under my care, at which time I removed a large fibroid uterus with both tubes, one ovary and the appendix. The cervix was not removed and at that time there seemed to be no particular reason for doing so. After that, she was in much better health for many months. Following the operation she had a scant discharge every month. Before the operation the discharge had been rather bright in color, but afterwards it became darker and contained mucus. During the last year before the final operation there was some inter-menstrual bleeding, and sometimes there was blood from the rectum. She was decidedly constipated and during menstruation there was an aching pain when the bowels moved. Examination revealed an extensive thickening and hardness in the recto-vaginal septum and an extensive thickening of the bowel wall. I advised operative procedure.

In May she went to the Hopkins Hospital to Dr. Cullen, and a few days later, through his courtesy, I was enabled to see the operation. There were some adhesions, which were gradually disposed of, after which the ureters were dissected out, a large number of veins tied, and the mass removed after a siege of four hours. In freeing the posterior vaginal wall there was an escape of dark colored blood from the space behind the cervix. The cervix was closely adherent to the rectum, which was itself badly involved. Intending to excise the anterior part of the rectal wall only, he made an incision and found the condition so bad that he finished finally with a four inch resection. At the end of the operation the patient was all in, and for two weeks her condition was very serious. After some days urine passed through the vagina as did the major portion of the bowel contents. Two months later there was an opening, one and a half centimeters in diameter, in the anterior part of the rectum. She died a few months later. The specimen removed showed extensive infiltration of the rectal wall and posterior part of the cervix, which was perforated. The infiltration also involved the vagina. If I had removed both ovaries in the second operation, perhaps she might have been saved all subsequent trouble.

Adenomyomata have been found around the navel, along the course of abdominal scars and

in the recti muscles. The growths are usually small, occur during the child bearing period, increase in size during menstruation and, where there is an external opening, discharge blood. Cullen refers to three cases of recti muscle involvement, which he collected from the literature and considered very rare.

Early in 1922 a Mrs. McM. came to me on account of a breast tumor which proved to be a cancer. About eight years before, on account of a complete placenta previa, I delivered her at term of a normal child by Cesarean section. Before leaving my office she said the upper part of the old abdominal incision had never healed; that for a long time, for several years in fact, she had noticed a small lump just above the navel, which became sensitive during her periods and discharged about a tablespoonful of blood at that time. I found a distinct oval mass about two by one centimeters situated at the upper end and under the scar of the old abdominal incision, and about one centimeter from the navel. I operated on her for carcinoma and at the same time removed the growth from the abdominal wall, the latter proving to be a typical adenoma. Since this experience, I have seen or heard of a few similar reports. During the Congress of Physicians held here last year, two papers were read on the subject. In all of the few cases I have heard about there is a history of previous operation, resulting in invasion of the uterine cavity either by incision or by perforation by some instrument, and it is very evident that in all these cases there has been a transplant of endometrial cells into the tissues of the abdominal walls during operation, this having formed a nidus for the development of the tumor. In pelvic operations one often finds nodular swellings in the uterine cornua or along the tubal isthmus, to which the name of salpingitis isthmica nodosa or nodular salpingitis has been given. Most of these are cellular inclusions of tubal epithelium. The nodular or spindle-shaped growths in the round and sacral ligaments are, according to Ewing, more likely to be congenital and due to epithelial rests.

W. W. Russell, as early as 1899, reported finding endometrial tissue in the ovary. After Russell's observation, Cullen reported four or five cases, two of which were in his own service. Since then some notable articles have appeared, chief of which is Sampson's (1922). Sampson has been making an intensive search for the condition and reported finding 37 cases in a year's time these occurring in 170 abdominal operations for pelvic disease. These have been styled perforating, hemorrhagic or chocolate cysts of the ovary; but Sampson preferred the term, ovarian hematoma of Mullerian type, because they develop from the epithelial cells lining the uterus or tubes. Later terms, endometrioma or endometriosis, seem to have taken the medical fancy and will, on account of brevity and applicability, in all likelihood replace the more cumbersome designation. He attributes them to a regurgitation or back wash of epithelial cells from the uterus or tubes into the peritoneal cavity, frequently promoted by some abnormal condition like a retroflexion, polyp or fibroid.

M. R. Robinson says that with all deference to Sampson's achievements, these teachings excel any of the histogenic theories in pathological casuistry and fantasy. Sampson's views on the subject, however, seem to have met with general acceptance. The points of development of these growths have a direct bearing on the relationship of the fimbriated extremities of the tubes to other structures, and these are the under and lateral surfaces of the ovary and the most dependent part of the cul de sac of Douglas. These implantations may involve one or both ovaries or may be found on the peritoneum without involvement of either. They may be located most anywhere on the posterior surface of the broad ligaments and the pelvic fossa. Somewhile ago I found during an operation a hard area of limited extent at the bottom of the vesico-uterine fold, which contained chocolate colored blood. This was excised, but not examined. The peritoneal endometriomata are generally small and isolated, and are usually of little significance clinically. The implantation on the ovary may be superficial, in which case the growth is small, or it may be deep and develop into a cyst several centimeters in diameter. Sampson believes that there is a tendency to self-destruction in these growths through the intermittent filling up with menstrual blood and subsequent exfoliation of cells, as occurs with menstruation. There is always a tendency to perforation at the time of the menses due to pressure of confined blood and, when this occurs, there is a disposition to the formation of adhesions. Implants on the peritoneum may take

place by the direct deposit of epithelium from the tube, or may be secondary to the rupture of an ovarian endometrioma. In the latter case he believes the growths may be more dangerous than the primary, although this is hard to determine. He further expresses the belief that these implants may be the cause of ovarian cysts and carcinomata.

I recently operated on a patient 53 years of age, who had been menstruating regularly and profusely with no indication of the menopause. She had for a long time been complaining of pain in the right iliac region. The operation was for removal of a multinodular fibroid and the ascertaining and removal of the cause of pains, possibly a bad appendix. The condition was as diagnosed; but, in addition, there was at the isthmus of each tube a nodular swelling about the size of a bean. The left nodule had a distinct small area like a blood clot and around it a few small vesicles. The right was the same, only less pronounced. They were both of endometrial origin. The uterus contained a small polyp, and both ovaries were plastered down to the pelvic floor and very adherent.

At a recent meeting of the American Association of Gynecologists, Keene reported a bladder affected by an adherent chocolate cyst where there was frequent micturition and discomfort at the time of menstruation, but not during the intervals. Inspection of the bladder showed a bluish-red area and around it some small vesicles. Another similar experience was described on the same day by another writer.

Sampson, in a later paper, reports three cases, which he calls inguinal endometriosis. Nodules were found in the groin. They became tender during menstruation and were found to contain cavities filled with blood. From these findings he has developed the theory that these are or may be metastases, just as might occur in carcinoma. Ewing, in discussion of the paper, says "Anyone who is familiar with the structure of pelvic tissues will realize that this region is a regular *pot pourri* of tissue abnormalities of various types. Here we see metaplasias of the intestinal and of the peritoneal lining cells. Nearer the uterus and tubes we often see tissue rests which have never been successfully interpreted or classified by any one, and he is inclined to advise a little caution about acceptance of round ligament metastases.

In Resume.—Endometrial cells have the ability to invade directly the uterine musculature, forming adenomyoma of the uterus. They may be carried along the tubes during menstruation and, on contact with the pelvic peritoneum, form small tumors containing endometrial tissue. They may be deposited in the ruptured Graffian follicle and form the chocolate blood or hemorrhagic cysts, as variously styled. They may be deposited in the abdominal wound during operations on the uterus and form endometrial growths, and they may, if Sampson's conclusions are correct, be carried along the lymphatics and veins and, by metastases, cause tumors in the groin and possibly in far distant parts, as in cancer.

1744 *M Street, Northwest.*

THE MANAGEMENT OF LOBAR PNEUMONIA.*

By A. E. MURRAY, M. D., Beaverdam, Va.

Since the earliest medical records (460 B. C.) until the present time, lobar pneumonia, a malady which frequently confronts the physician, often costing the patient his life or robbing him of his future good health, and causing his friends and relatives great anxiety, has held its rank with other diseases in demanding of the physician much thought and consideration in caring for his patient.

A fundamental principle which experience has established is that no single plan of treatment can be advocated for all cases of pneumonia. If it be regarded as a constitutional disease with a local lesion, then the consolidated lung does not demand special treatment, provided it undergoes resolution without complications.

The patient should be placed in bed in a quiet, moderately heated, well-ventilated room and protected from all draughts.

The food should be of the most nutritious, easily digestible character, and should be given at three hour intervals with medicine so as to allow a period of rest.

The nurse should be instructed to watch for a lack of assimilation and gas formation, as a distended abdomen is not only uncomfortable to the patient but may prove fatal.

Venesection has been greatly agitated by medical men and it appears to be a settled

*Read before the Hanover County (Va.) Medical Society.

fact that venesection is very helpful to certain cases.

INDICATIONS FOR BLOOD-LETTING

If the patient has been healthy and is seen in the first or early in the second stage with a marked dsypnea, flushed surface, temperature 105° or more, pulse 120 or more, or a slow full pulse—showing cardiac oppression, the loss of 12 to 16 ounces of blood will often greatly relieve the symptoms. The relief of the symptoms should be the guide as to the quantity of blood to let, as it is done for the amelioration of symptoms, and not for cure of the disease.

There being no specific remedy which will favorably influence the pneumonic process, the physician is left to judge in each case what is best for the patient and to select from the pharmacopeia such agents as are necessary for conditions as they arise. Some mild cases will recover with very little or no treatment, while others demand much skilful attention.

When treatment is instituted, we should not only watch local conditions in the thorax, but should treat the patient in a general way. In the beginning, if venesection is not indicated, relief of pain may follow the use of cupping, hot poultices, mustard plasters or turpentine stupes. If the tongue is coated and the gastrointestinal tract inactive, a calomel purge is indicated, although vegetable purgatives may suffice. The cautious administration of some of the coal-tar derivatives incorporated with Dover's powder, codeine, or morphine, is helpful in relieving the distressing symptoms. These agencies are directed at relief of the distressing cough. For this purpose, probably morphine is best, in 1/12 grain doses, with one-half ounce solution of citrate of potassium flavored with lemon, and repeated every two or three hours.

Stimulation is sometimes necessary, even from the beginning, especially so in the aged, adynamic and alcoholic. Whiskey, one-half to one ounce, in milk every one to two or three hours, as necessary, acts very satisfactorily in some cases. Aromatic spirits of ammonia is also a good stimulant at this time. Sometimes it is neccessary to use strychnine in full doses throughout the attack, and quinine is helpful when administered with the strychnine at the beginning of the disease. Aconite and veratum viride are receommnded to relieve tension, and veratum viride is said to relieve delirium. I think it unwise to use more stimulation at first than is absolutely necessary. At this time, with a resistance in front of the heart, it is not a good procedure to over-stimulate, when we know that a crisis is coming.

Sometimes it is necessary to lower the temperature. A moderately high temperature (103-105) may be lowered by acetanilid guarded with strychnine, and sponging with alcohol, or water at a temperature of 60°F. Higher temperatures may require the application of icebag to the chest.

Shall we blister? and if so, when? It seems to be a universal opinion of the medical profession that if resolution is delayed, a blister locally, and iodides internally, are indicated. In this locality custom sanctions it, and the patient's friends demand that a blister be applied when the physician makes his first visit. I have seen as speedy recoveries without blisters as with them.

One typical case of lobar pneumonia, with the exception of an unusual amount of blood in the sputum, reached the crisis on the fifth day with the blister on the mantel.

From the second stage to convalescence it is very important to watch the heart's action, as most fatalities in pneumonia are due to cardiac failures. Digitalis, strychnine, nitroglycerine, and ammonia with whiskey, are probably our best stimulants. Strychnine sulphate, gr. 1/30, should be given every 3 hours and digitalis in moderate doses unless the tension is very low, then give full doses. If the tension is high and the right heart is embarrassed, nitroglycerine and aromatic spirits of ammonia are indicated. Whiskey may tide over an attack. Morphine in moderate doses also seems to act as a stimulant, and when dyspnea is associated with pain, a hypoderemic of morphine often proves beneficial. However, if there is pulmonary edema, opiates are contraindicated.

Insomnia and delirium can usually be relieved by sulphonal, trional, or chloral hydrate combined with sodium bromide.

In the latter stages of pneumonia ammonium chloride is a very popular drug and being eliminated through the mucous membrane, is supposed to aid resolution. It may be suspended in a stimulating expectorant mixture similar to the following:

Ammonii chloridi ʒiii
Aquae chloroformi ʒii
Syr. Picis Liquidae
Syr. Pruni Virginianae aa ʒvi

Sig: Take 2 teaspoonfuls every three hours.

In the second stage I have used ammonium chloride suspended in mistura glycyrrhizae composita.

Another compound in which I have used ammonium chloride and gotten good results is syrup white pine and tar compound, manufactured by S. E. Massengill Co., Bristol, Tenn. Each fluid ounce of this preparation represents (alcohol, 6 per cent): Chloroform miv, White Pine Bark gr.xxx, Wild Cherry gr.xxx, Spikenard gr.iv, Balsam Poplar Buds gr.iv, Sanguinaria gr.iii, Sassafras gr.iiss, Tar q.s.

I have added codeine sulphate to the above mixture when it was necessary to suppress the cough.

After reaching convalescence, the patient should have a very nutritious diet and the quantity increased as rapidly as it can be digested and assimilated.

Tonic preparations, such as iron, quinine, strychnine and cod-liver oil compound should be administered as necessary.

In regard to serum treatment, it is claimed that if the serum is prepared from the same strain of organisms as that causing the disease, then good results will follow its use. This can only be done in hospitals or close to well-equipped laboratories. So far as I can ascertain, vaccines have not proved of much value.

TREATMENT OF ACUTE LOBAR PNEUMONIA.*

By W. A. CAMPBELL, M. D., Old Church, Va.

Discharges from the mouth and nose should be burned. The patient should be isolated in a quiet room, so located that the sun may shine into it as many hours of the day as possible. At least two windows, or a window and a door should be kept open. An open fire is to be had if possible, when artificial heat is needed. A "heater" will do more harm than drugs can do good, in some instances. The temperature of the room should be kept at about 65° F. The patient should be screened from drafts.

The position in which the patient breathes most easily should be allowed; the tendency to hypostatic congestion should, however, be antagonized, if possible. As a rule, reasonable change of position is comforting.

Rest of mind and body cannot be overdone.

The bed clothing in winter should be light weight woolen blankets—just enough for the patient's comfort.

Give a warm sponge bath night and morning—with windows and doors closed, and the patient under the cover in cold weather. Keep the mouth clean with salt water, or some other pleasant wash.

Water should be taken freely.

The diet should be nutritious, but easily digested. Carefully estimate the patient's digestive ability, thus in large masure avoiding gaseous distention of the intestines, and diarrhoea. Meat and vegetable broths, strained oatmeal, buttermilk, or lactic-acid milk, calf's foot jelly, fruit juices, etc., are suitable forms of nourishment.

After the crisis, soft toast, soft eggs, chicken, game, etc, may be taken. Gradually increase the diet, being guided by the patient's taste, when possible.

In cases of average severity, the patient may be allowed to sit up after the temperature has been normal for ten days.

The published results obtained by the use of serums, vaccines, etc., promise increasingly favorable reports for the future.

A laxative, to be repeated if needed for the relief of toxemia or constipation, is of immense value. Calomel is the favorite for the relief of toxemia, followed by a palatable saline.

Digitalis should be given in full doses when there is a suspicion that pneumonia is present, and the dose increased or decreased as indicated. It should be increased if the pulse becomes unusually accelerated or weak.

Caffein, strychnine, camphor in oil, whiskey and ammonia are valuable in circulatory failure.

Pituitrin, or adrenalin, should be injected in emergency, as long as the systolic blood pressure remains below the pulse frequency, and until there is a safe interval between them.

Venesection should be done in cases with cyanosis and failure of the right ventricle.

Quinine is of real value when given in sufficient doses. It seems to destroy the pneumococcus.

A full dose of some pleasant alkali, three times a day, is of value.

*Read before the Hanover County (Va.) Medical Society.

Mustard poultices, hot stupes, and wet or dry cups, will relieve the pain in many cases. Morphine, hypodermically, may be necessary.

Cough can best be relieved by codeine. Ammonium chloride, and syrup ipecac, if the expectoration is very viscid, may be of service.

Atropine is of value when there is excessive bronchial secretion.

Insomnia can usually be relieved with bromides or chloral.

For abdominal distention, turpentine stupes and asafoetida enemas usually suffice. A rectal tube is also effective. Pituitary extract may afford temporary relief.

CANCER OF THE GASTRO-INTESTINAL TRACT BELOW THE DIAPHRAGM.*

By SAMUEL ORR BLACK, M. D., Spartanburg, S. C.

Cancer of the stomach constitutes about 25 per cent of the malignancies of the body. It is more frequent in the pylorus than in the cardia and is more often situated on the lesser than on the greater curvature.

At the present time many clinics contend that it follows ulcer in 70 to 80 per cent of the cases. Others, equally as reliable, insist that gastric ulcer becomes malignant in but 10 to 12 per cent of the cases. Obviously, somewhere between these two extremes the truth lies.

Perhaps the chief reason for so great a discrepancy lies with the pathologists themselves. What is a malignant slide to one will be benign to another. These specialists have never gotten together in their interpretation of border-line pathology.

Recently, the American College of Surgeons has appointed a committee of distinguished personnel to collaborate with a committee of eminent pathologists, to study bone tumors in general and sarcoma in particular. The motive of the college is to find common ground on which to stand, to clarify existing confusion so as to select one term to be used by all when speaking of a particular condition. It is, therefore, obvious that, until pathologists agree, ordinary men (physicians and surgeons) must await the truth as to just how often gastric carcinoma follows in the wake of gastric ulcer.

In the gastro-intestinal tract, cancer is found almost exclusively in that portion harboring an acid medium. Proof of this is seen in its relative frequency on the pyloric side of the valve and its rarity on the duodenal side, which is normally alkaline in reaction. Throughout the small intestine the juices are alkaline, and cancer here is almost a surgical curiosity. In the cecum, the juices are acid and cancer is again a common occurrence.

In a series of 1846 cases of cancer of the bowel, published by the Mayo Clinic, the small intestine was involved but twenty-four times.

Early cancer of the stomach is difficult to diagnose, before, during or after the operation. Before operation, in many instances, it is impossible to state that this particular case is a cancer or that it is simply an ulcer. In fact, during the operation, with the abdominal wound open, and the affected parts lying in plain view, it is often impossible to decide. Differences existing among pathologists have already been cited, and from these it is evident that, even after the operation is over and the reports of different pathologists are at hand, the surgeon is often still in doubt as to whether the lesion was malignant or benign.

Clinically, there are a few simple facts which should be borne in mind. The peak of the ulcer curve occurs about fifteen years earlier in life than does the peak of the cancer curve. The ulcer patient usually gives a history extending back over a period of many months, often years, whereas, it has been our observation that in the case of cancer, the history extends back from but three to six months as a rule.

It is, of course, difficult to prove that some cancer cases were not at one time ulcers. All abdominal surgeons see cancer cases that have a history of having had stomach trouble for many years, twenty or more, and it is unreasonable to assume that cancer existed all that time.

The treatment of choice for operable gastric carcinoma is clean cut excision. By such a direct attack it is often possible to remove the entire disease bearing area. The indirect route, gastro-jejunostomy, affords only temporary relief.

The Mayo-Polya technique for operable malignancy situated in the pyloric end of the stomach is comparatively simple, is relatively easy to perform, and gives a satisfactory physiological function.

Healing of a gastric wound takes place

*From The Mary Black Clinic.

within a very short time. Examinations made within eight or ten days by the naked eye alone reveal in the absence of infection, a well-healed post-operative gastric wound.

There are two things which interfere with rapid union, or healing in a gastric wound: first, infection, and, second, extensive fibrosis in the parts immediately adjacent to the site of injury.

Cancer of the Small Bowel

It has been estimated that carcinoma occurs in the small intestine in about 3 per cent of all the carcinomas of the entire intestinal tract. Necropsy reports from various large clinics cite the greatest frequency in the duodenum, next, in the jejunum, and, lastly, in the ileum.

It is an accepted fact that duodenal ulcer rarely, if ever, becomes malignant. The reason for this is not known. In the duodenum, malignancy is occasionally seen in the region of the ampulla and, when extensive, it is often impossible to tell whether the lesion began in the head of the pancreas, in the mucosa of the ampulla, or in the mucosa of the bile duct.

In the jejunum and ileum, cancer occurs as a degenerated polyp or as a ring carcinoma. Polyp may be single, though often they are multiple and, extending into the lumen of the bowel; they may produce obstruction or intussusception.

Ring carcinoma at first is very small, but as it closes the lumen of the intestine, the proximal bowel gradually distends and approximates or even surpasses the large bowel in diameter. When found early, complete removal is the procedure. If this be inadvisable because of too extensive involvement, entero-enterostomy will temporarily relieve the difficulty by short-circuiting the fecal current around the point of obstruction.

Cancer of the cecum is the least malignant of all cancers in the gastro-intestinal tract—from the mouth to the anus. In this region, delayed or late operation will do more for the patient, than it will for malignancy situated elsewhere. A diagnostic point in interpreting abdominal pathology is the presence of visible and palpable peristaltic coils of bowel. This is usually present in cancer of the colon, and as the constriction becomes more marked, the distended coil becomes more and more prominent.

The treatment of colonic cancer is, whenever possible, wide excision of the cancer-bearing area. The two-stage operation is becoming more popular. When the lesion is in the right colon, Crile advises ileo-colostomy first, and, after ten to fourteen days, he goes back and excises the growth itself. Should the lesion be in the middle or left colon, cecostomy might be performed, to be followed later by resection. Such a process side-tracks the fecal current from the proposed operative field, tension along the suture line after resection is practically done away with, and the operative time itself is lessened.

We believe it to be next to impossible to do a resection of a portion of the colon without soiling the operative field. In this operation, the retro-peritoneal space is opened and its defensive mechanism is less than that of the peritoneal cavity. Besides this, feces, passing over a freshly made raw surface, predispose not only to immediate infection, but to a low grade generalized infection which often is not fatal until ten, twelve or fourteen days after the operation itself. This is obviated in intestinal resection by the preliminary ileo-colostomy or cecostomy.

In the transverse and descending colon, the Mikulicz operation frequently affords a simple technique and an easy convalescence. At the first seance, the diseased area is mobilized and brought out into the abdominal wall where it is allowed to remain for several days, depending upon its blood supply. When the incisional wound has sealed over, the tumor area is excised by knife or cautery and the artificial openings are dressed as frequently as is necessitated. The patient is allowed up, and when improvement has taken place and edema has disappeared from the apposing loops, an opened forcep is inserted, one blade into one loop, the other blade into the other loop, and the forcep is gradually tightened. After several more days the forcep is removed and the ends of the two loops of bowel are anastomosed. The parts are then dropped back into the abdominal cavity frequently with a catheter fastened into the lower ileum for drainage purposes. After four to six days it is removed.

Recently the question has been raised as to whether cancer of the rectum is more amenable to radium or to the knife.

In either instance, colostomy is usually first performed; after a week or two, the patient is

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given a low spinal anesthesia and, after Kraske, the rectum is removed. When radium is used, it is to be applied directly to the involved parts either down through the colostomy opening or up through the anus itself.

Roentgen therapy through the loins and through the back should supplement this form of treatment. At the present time it is our belief that the operative procedure offers more than does the radium.

Generally speaking, in surgery of the gastro-intestinal tract below the diaphragm, before undertaking any operative treatment, the surgeon should well consider the patient as a whole. He should not lose sight of the great advantage afforded him by (1) the two stage technique; (2) blood transfusion, if anemia exists; (3) infusions for dry tissues and general weakness; (4) rest and comfort by the administration of morphia sufficient in amount to maintain quiet; (5) heat, externally applied in the form of warm blankets, immediately following operation, and, lastly, it should not be forgotten that a low spinal anesthesia, in a great many cases, is far superior to inhalation anesthesia for rectal carcinoma.

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THE SOMATIC SIDE OF THE MENTAL PATIENT

By V. BLACKSTONE WILLIAMS, M. D., Washington, D. C.
Internist, St. Elizabeth's Hospital.

Commenting upon the physical ailments of mentally ill individuals, one might expect these to be of a more difficult interpretation than patients with normal minds, and they are in many instances.

At Saint Elizabeth's Hospital, the insane are being cared for in a separate department of medicine and surgery that is in reality a hospital within a hospital devoted to the physical care of these patients.

In charge of this particular department is a Chief of the Medical and Surgical Services, who is the executive head and attends to the numerous administrative duties connected therewith. Associated with him is a surgeon who cares for all surgical cases and operations and an internist who diagnoses and treats all of the medical cases, while valuable assistance is given these associates by carefully selected interns upon each of these services.

A training school for nurses has been established, where they receive a regular course in theory and practice in the care of medical and surgical patients and later affiliate with other hospitals for obstetric and pediatric nursing.

Briefly, the system used in the care of a patient who may have a physical illness in our hospital is as follows: First, the psychiatrist upon his ward notices that a patient has a subjective or objective symptom which he believes should be investigated by our department; it may be cough, loss of weight, expectoration, fever, skin rash, vomiting, hematuria, pain and so forth. He transfers this patient with a briefly written note to our hospital department.

Upon admission to the receiving ward, the patient's temperature, pulse and respiration are taken by a nurse who starts a hospital ward chart consisting of a temperature, pulse and respiration sheet, history and physical examination sheet, nurses' notes, laboratory reports, treatment and diet ordered and progress notes.

A complete physical examination is made by the intern and the result recorded systematically upon the chart.

Suppose the case to be one of acute follicular tonsillitis; this diagnosis is written upon a card in the office, where a card system of all admissions, transfers, deaths, etc., to this department are recorded, and at the end of every month a summarized report of all cases treated is made from these cards. When the patient recovers from his tonsillitis attack, he is transferred back to the ward from which he came. A brief transfer note written by the internist to the psychiatrist containing the diagnosis and present condition of the patient accompanies the patient to his ward. Another typewritten detailed note is made by the internist, a summary of the patient's physical condition, giving the diagnosis and important laboratory findings more in detail than the transfer note.

In this manner one can readily see that the patient gets the full benefit of especially qualified physicians, who devote their entire time to this work; he is in a hospital ward where he receives systematic medical and surgical treatment and special nursing care, and this takes the responsibility of an organic disease rightly away from the psychiatrists, allowing the latter to devote their entire time to their psychiatric work.

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A dispensary is also run daily for up patients, where special examinations and treatments are made, as in other clinics, with ear, eye, nose and throat, skin, medical, surgical and genitourinary service. Atttending specialists donate their services to this work.

Upon all cases who die an autopsy permission is requested of their relatives and a very high percentage obtained. These furnish not only material for scientific study, but help materially in showing us our mistakes in diagnosis and treatment, as well as our good results. A laboratory takes care of all routine tests, also research work is constantly performed by our pathologist, neuropatholgist, bacteriologist and their technicians. Our pathologist has taken a special interest in the recording of all autopsy findings, including anthropometric and endocrine data as well as in directing the entire activities of the laboratory.

Our clinics and clinical material are opened to students of the medical schools and to physicians, and ward walks, lectures, operations, examinations and autopsies are witnessed by them.

Several cottages for male and female tuberculosis patients are maintained, where these patients lead a life mostly outdoors and receive special diets and special treatments when indicated.

A ward for all the chronically ill medical cases is run by this department, as well as a contagious ward which is held in readiness at all times for use when necessity arises.

Of course, it is not our claim to cure insanity by treating these organic medical and surgical ills, but to do the same as any physician; namely, to relieve suffering and prolong life.

If an acute or chronic appendicitis might be a factor even remote in a patient's psychosis, we remove this factor; likewise, we deal with any other organic disease amenable to treatment.

One can see what a satisfaction this is to relatives of these patients to know that everything is being done for their comfort and welfare, that their physical ailments are not neglected by the institution which they enter and that a like service is given them comparable to the best hospitals of this country.

Of strictly medical interest might be mentioned some of our problems and interesting observations. General paresis is being treated by malarial inoculation, with hopeful results. Chronic encephalitis cases are being studied, in which we find destruction of the substantia nigra at autopsy to be constant. Some of the brain tumor cases presented no symptoms which would lead one to suspect their presence, all symptoms at the last being obscured by their psychosis and a terminal illness while in the hospital wards, and an autopsy disclosed a large tumor mass. Endocrine disturbances and pituitary tumors, while not so frequent or easily diagnosed, are looked for constantly, and numerous basal metabolism, blood chemistry tests and X-ray examinations of the sella turcica are made. A great many of our elderly patients and our cardiac cases die with cerebral hemorrhage (apoplexy), so a review of cerebral hemorrhage cases was begun.

Tonsillitis cases which were cultured showed that most of them harbored resistant hemolytic streptococci, some Vincent's angina, and a lesser number of other bacteria were the predominating organisms.

Pyorrhea and numerous abscesses of the teeth and all dental conditions are referred to our dental surgeon, particularly in neuritis afflictions, myalgia cases, cardiac cases, pernicious anemia and stomach ulcer patients.

Several lung abscess cases are at the hospital undergoing special treatments from time to time.

Our pleural effusion cases all recovered without tapping the chest with the exception of a few, and I believe promiscuous tapping of the chest, because fluid is present, should be abandoned, and it should rarely, if ever, be done for diagnostic measures.

Sunlight, violet ray, both the Alpine and the Kromayer lamps, have been useed upon our tuberculosis cases with more or less benefit, and excellent results have been obtained in some of our skin cases.

Several cardiac cases with broken compensation, who could not walk up and down stairs to their meals with other up patients in the psychopathic wards, are under appropriate treatment, able to lead a life free from this added exertion, in the medical wards.

Last minute injection of adrenalin into the heart muscle was tried in dying cases considered hopeless, without results.

A modified Sippy diet has helped our gastric ulcer and duodenal ulcer cases.

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Rigidity of the abdominal muscles cannot be relied upon in the examination of the abdomen of an insane patient as a sign of acute inflammatory processes, and localized tenderness will not always be elicited; in fact, I believe some mental patients can suppress this sign to an unbelievable degree.

Cancer cases are somewhat rare in the insane, while tuberculosis is an almost constant ending in true catatonic dementia precox cases, and a small heart is found in the latter type of mental case upon post-mortem examination.

Gastric ulcer in the insane is at times very hard to diagnose, as early signs and symptoms are lacking. This is true also of tuberculous peritonitis and colitis which usually turns out to be some other condition than the expected one.

One case of amoebic dysentery was treated with excellent results by colonic irrigations with mercurochrome, using a special method in taking advantage of antiperistalsis while introducing the solution into the colon by a special apparatus, making use of a Hughen's valve and a Norman tube.

Erysipelas cases were treated with mercurochrome and acri-violet locally, with better results by this method than any other known treatment advocated.

Intravenous administration of mercurochrome in streptococcic infections was without appreciable effect; likewise, the relapsing fever treatment of general paresis by inoculation with spirochaete directly into the blood stream was productive of no benefit upon one series of cases.

I might add, the treatment of cancer by the X-ray and the X-ray treatment of goitre and hypertrophied tonsils is being undertaken.

Many other diseases are at present being investigated scientifically in this department, which will be mentioned from time to time in other papers.

A few interesting cases may be briefly noted, as follows:

1. A patient with aphasia had numerous vague symptoms, the exhaustive study of his case being entirely negative. At autopsy, a small area centrally located in the right lung showed a tuberculous abscess the size of a dime.

2. A case with continual vomiting for ten days made an uneventful recovery, when death appeared imminent, under mixed treatment. The diagnosis given was syphilis of the mediastinal lymph glands and achylia gastrica with chronic gastritis.

3. A male patient entered the hospital and was admitted shortly thereafter to our department where the only symptoms present were manifestations of acute chorea. The case terminated fatally. Autopsy was performed and no pathology was found anywhere to account for his difficulty, so the cause of death was given as unknown, as a thorough pathological study revealed all the organs to be normal.

4. A young colored female with continual vomiting, admitted as an emergency case, was diagnosed pyloric obstruction, the patient presenting all the signs of an acute abdomen, so to speak. Autopsy later showed tuberculosis of the tracheo-bronchial glands with pressure upon the esophagus, a small fibroma of the pylorus and tuberculoma of the right adrenal gland.

5. With a rigid abdomen and a white blood count of 20,000, and a polymorphonuclear count of 85 per cent, a case of general paresis was admitted with a view to operation, but operation was advised against. No symptoms or signs were present in the lungs. He died the day admitted and autopsy showed a small apical pneumonia of the right lung.

6. A case of syphilis with Vincent's angina, with both general and local spirochaetes present, was among the cases treated.

7. A case of aphasia in cerebral arteriosclerosis, apparently well in between the aphasic attacks, later died during one of these periods.

8. In all the patients inoculated with malaria for the treatment of general paresis who developed malaria, none of them presented any enlargement of the spleen, which is one of the diagnostic features of this disease.

9. One man developed a diaphragmatic hernia of the stomach through an old gunshot wound of the diaphragm.

10. A patient who had a distinct chill, fever and all the symptoms which one would expect in an early chest involvement, but without any characteristic findings in the chest, later, upon physical examination, while under a short period of observation, presented abdominal rigidity and was transferred to the surgical service. At operation two pieces of wire were removed from his stomach and, by esophagos-

copy, a thermometer case was taken from the esophagus.

These ten cases will no doubt convey to any one the necessity for close observation and special study of physical ailments in the insane. The mortality rate per population of the hospital showed a marked drop six years ago following the establishment of such a service, and it has remained at this lower level ever since.

In conclusion, I believe that all hospitals for the insane should have a separate department for the care of somatic diseases. This service also is extended for all employees and out-patients.

Many opportunities for scientific study of medical and surgical cases present themselves, under these conditions, in an institution of this kind, that is, a well-equipped department devoted exclusively to this work.

The relations of the physical to the mental, and *vice versa*, and the intimate and intricate associations and connections between these two can be better understood under these ideal surroundings.

Last of all, the patients benefit by this system in making their adjustment toward their environment, whether it be parole, discharge to home life, or a hospital life, with a freedom of physical distress.

3624 *Davis Street, Northwest.*

Correspondence

Removing Pistons Hung in Record Syringes.

RICHMOND, VA., *June* 4, 1926.

TO THE EDITOR:

Sometime ago the writer had trouble from the locking of the pistons in Record syringes used for blood transfusion. The following method seems safe and satisfactory, especially when used before the blood has dried in the syringe:

The offending syringe is taken to the auto service station, where compressed air is available. It is wrapped, except for the needle fitting, in 10 to 12 thicknesses of old newspaper, in order to protect one from the possibility of being cut by flying glass in case the syringe explodes from the pressure. Then using the valve stem of a tire over the needle fitting, the air is turned into the syringe.

In all cases so far attempted the piston is immediately expelled. J. O. FITZGERALD, JR.

The County Society

For Better Acquaintance.

With a view to arousing and maintaining interest in the COUNTY SOCIETY, it is requested that, as far as possible, every county in the State should have a county society.

Any county with three or more eligible physicians may organize and apply for a charter from the State Society, thus securing the privilege of representation in the House of Delegates of the State Society at its annual meetings.

Only one component society shall be organized in any county.

County societies which have been inactive should re-organize. Upon request, your Councilor, the President or Secretary of the State Society will help in any way possible.

Inquiries addressed to the MEDICAL SOCIETY OF VIRGINIA, 104½ West Grace Street, Richmond, will have prompt attention.

Do you know that fellowship in the American Medical Association, the largest association of its kind in the world, is dependent upon membership in your State Society, and that membership in your State Society is dependent upon membership in your County Society?

Each County Society shall have general jurisdiction over the medical matters in the County.

Dues in the State Society are five dollars a year, the fiscal year beginning January 1. Without other charge, members receive the "Virginia Medical Monthly," official organ of the Society, and legal defense if sued for alleged civil malpractice.

The Reference Committee of the American Medical Association on Reports of the Board of Trustees and Secretary of that Association, in commending the report of its secretary, Dr. Olin West, states that "The County Society should be the fountain head of scientific work. The secretary very properly points to a danger in this connection. The scientific program of a county society should accomplish two distinct things, instruct the membership and develop in members the scientific ability and the ability to express themselves. If these programs do not bring to the society those who are qualified to speak and able to speak, instruction will suffer. On the other hand, if this is done to the exclusion of discussion by members generally, there will be no development. State associations and county societies will do well to give special study to this problem."

Meetings of the County Societies should be made attractive so as to hold the interest of

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the individual member. A program committee may arrange for the discussions of books and journals, and some one may be appointed to give a case report. Part of the time at each meeting might very profitably be given to getting better acquainted, for

"When you get to know a fellow, and you understand his ways,
Then his faults won't really matter, for you'll find a lot to praise."

Womans Auxiliary

To the Medical Society of Virginia

Advantages of Organized Effort Among the Women.

At the request of the officers of the Auxiliary, this space has been set aside for communications from them regarding matters of interest, both to the profession and to the women members of their families.

All communications should be addressed to Mrs. E. F. Truitt, Secretary, Westover Avenue, Norfolk, Virginia.

The President of the American Medical Association, Dr. Wendell Phillips, in speaking to the Woman's Auxiliary, in Dallas, Texas, said his first "Auxiliary" to success was his wife, but he had found there was much good work being done by the doctors' wives besides courage, loyalty and devotion to their husbands.

He complimented the Woman's Auxiliary for their splendid work in helping to stamp out a deadly menace to public health that was creeping in on the States of Virginia and Texas. In both cases, the Woman's Auxiliary had been called upon and rendered valuable assistance.

There was much applause when the Virginia Auxiliary's report was read, telling of the stand our women had taken with their husbands in fighting that menace (quackery) and of our victory in Virginia.

Congratulations, Virginia Women!

Let us get busy! Our next goal is to place "*Hygeia*" in every school; to co-operate with the profession, both individually and collectively, in every way and to co-operate with existing health and welfare organizations. They need us. Let's offer our services.

Educate the public in health matters. Tell the true story of medicine to the public.

Urge periodical health examinations, made by regular physicians and not by commercial organizations.

If your county is not organized, please get together at once.

ALICE LEIGH,
(MRS. SOUTHGATE LEIGH)
President.

The Truth About Medicine

In addition to the articles enumerated in our letter of March 27th, the following have been accepted:

Eastman Kodak Co.
- Tetrabromophenolphthalein Sodium Salt—Eastman.
- Tetraiodophenolphthalein Sodium Salt—Eastman.

Lederle Antitoxin Laboratories
- Scarlet Fever Streptococcus Toxin for the Dick Test—Lederle.

H. K. Mulford Co.
- Pituitary Body Anterior Lobe Desiccated—Mulford.
- Tablets Pituitary Body Anterior Lobe Desiccated—Mulford, 2½ grains.
- Tablets Pituitary Body Anterior Lobe Desiccated—Mulford, 5 grains.
- Scarlet Fever Streptococcus Antitoxin (Concentrated).
- Sterile Solution of Anterior Lobe Pituitary—Extract—Mulford.
- Ampules Sterile Solution of Anterior Lobe Pituitary Extract—Mulford, 1 cc.

Parke, Davis & Co.
- Corpora Lutea Soluble Extract—P. D. & Co.
- Ampules Corpora Lutea Soluble Extract—P. D. & Co., 1 cc.

Swan-Myers Co.
- Ampules Dextrose 50%, 50 cc.—Swan-Myers.

Wilson Laboratories:
- Pituitary Solution U. S. P. X. Obstetrical.
- Ampoules Pituitary Solution Solution U. S. P. X. Obstetrical—Wilson, 0.5 c.c.
- Ampoules Pituitary Solution, U. S. P. X. Obstetrical—Wilson, 1 c.c.
- Pituitary Solution Surgical
- Ampoules Pituitary Solution Surgical—Wilson, 1 c.c.

NEW AND NON-OFFICIAL REMEDIES

Mead's Powdered Lactic Acid Milk (Cultured).—A modified milk product prepared by fermenting whole milk with *B. acidi-lactici*, drying and powdering. Each 100 Gm. contains approximately protein, 29 Gm.; carbohydrate, 26.4 Gm.; fat, 28.8 Gm.; free lactic acid, 3 Gm.; and ash, 6 Gm. This preparation is proposed for overcoming the so-called buffer action of cow's milk in the infant's stomach. Mead Johnson & Co., Evansville, Ind.

Mead's Powdered Lactic Acid Milk (Acidified With Lactic Acid U. S. P.)—A modified milk product, prepared by adding lactic acid U. S. P. to whole milk, drying and powdering. Each 100 Gm. contains approximately: protein 26.4 Gm.; carbohydrates, 34 Gm.; free lactic acid, 3 Gm., fat, 24 Gm.; and ash, 6 Gm. This preparation is proposed for overcoming the so-called buffer action of cow's milk in the infant stomach. Mead Johnson & Co., Evansville, Ind.

Pollen Extracts—Mulford.—In addition to the products listed in New and Non-official Remedies in Jour. A. M. A., June 6, 1925, p. 1734, the following are also marketed as fourth series in five glass syringes (doses 16 to 20, inclusive), each containing 1,000 protein units: Lamb's Quarters Pollen Extract—Mul-

ford: Ragweed Pollen Extract (Fall)—Mulford; Timothy Pollen Extract (Spring)—Mulford; Wormwood Pollen Extract—Mulford. H. K. Mulford Co., Philadelphia.

Concentrated Pollen Extracts—Swan-Myers (see Jour. A. M. A., May 30, 1925, p. 1634; Jan. 23, 1926, p. 277; Feb. 27, 1926, p. 625). These are marketed in 2 c.c. vials and in sets of five capillary tubes for diagnostic tests, each tube containing sufficient extract for one test. Swan-Myers Co., Indianapolis, Ind.

Scarlet Fever Streptococcus Antitoxin—Squibb (Jour. A. M. A., Jan. 16, 1926, p. 199). This product is also marketed in packages of 1 c.c. vials for the diagnostic blanching test containing sufficient toxin for ten tests. E. R. Squibb & Sons (Jour. A. M. A., Apr. 10, 1926, p. 1131).

Typhoid-Paratyphoid Prophylactic—Cutter. A typhoid vaccine (New and Non-official Remedies, 1925, p. 360), marketed in packages of three vials; in packages of one 20 c.c. vials, and in packages of one syringe containing a mixture of typhoid bacilli and paratyphoid bacilli types A and B. Cutter Laboratory, Berkeley, Cal.

Parke, Davis & Co.'s Standardized Cod Liver Oil.—It has a content of fat soluble vitamin-A which is not less than 440 units per Gm. and an antirachitic potency of not less than 59 units per Gm. Parke, Davis & Co., Detroit.

Pituitary Solution U. S. P. X.—Wilson.—An extract of the posterior lobe of the pituitary body of cattle, preserved by the addition of chlorbutanol. It is standardized to have the strength of solution of pituitary U. S. P. For a discussion of the actions, uses and dosage, see Pituitary Gland, New and Non-official Remedies, 1925, p. 260. The product is marketed in 0.5 and 1 c.c. ampules. Wilson Laboratories, Chicago.

Scarlet Fever Streptococcus Toxin for the Dick Test—Lederle.—It is prepared by growing the scarlet fever streptococcus in broth (see Diphtheria Immunity Test. Jour. A. M A., Jan. 16, 1926, p. 199). It is marketed in packages of one vial containing diluted toxin sufficient for ten tests; in packages of one vial containing concentrated toxin sufficient for 100 tests and a vial of diluent. Lederle Antitoxin Lederle Antitoxin Laboratories, New York.

Scarlet Fever Streptococcus Toxin—Lederle.—It is prepared by growing the scarlet fever streptococcus in broth (see Scarlet Fever Immunity Test, Jour. A. M. A., Jan. 16, 1926, p. 199). It is marketed in packages of four vials of diluted toxin containing, respectively, 500, 1,000, 2,500 and 5,000 skin test doses; in packages of four 20 c.c. vials of diluted toxin containing, respectively, 500, 1,000, 2,500 and 5,000 skin test doses per c.c.; in packages of forty vials of diluted toxin providing ten immunizations. Lederle Antitoxin Laboratories, New York.

Ampules Dextrose 50%, 50 c.c.—Each ampule contains 50 c.c. of a fifty per cent solution of dextrose U. S. P. Swan-Myers Co., Indianapolis. (Jour. A. M. A., April 17, 1926, p. 1213).

PROPAGANDA FOR REFORM

Iron and Blood Regeneration.—"The history of anemia treatment with drugs is indeed a tale to make the judicious grieve." On the whole, iron seems to enjoy the most constant favor by practicing physicians. The clinical control of the treatment of anemia is difficult and the number of variables almost infinity. As a result, widely differing views as to the efficiency of iron preparations have been recorded. Less than four years ago, Whipple wrote that among the potent factors exerting a positive influence of hemoglobin formation, stands first blood, meat and cooked liver, hemoglobin and butter fat. He found iron and arsenic in the common drug preparations inert under the conditions of his experiment. Williamson and Ets subsequently concluded that inorganic iron is absorbed and may be found in the liver and spleen, but is not converted into hemoglobin and that animals made anemic by bleeding did not recover more rapidly when inorganic iron is given. Williamson believes that the efficiency of food iron is pronounced. Recently, Barkan found that digestive ferments do not liberate iron from hemoglobin. This means that, if the pigment facilitates blood regeneration, it is not so much iron as the complexes with which it is associated that determines hematopoietic efficacy. (Jour. A. M. A., April 3, 1926, p. 1075).

Tuberculene, A Fraudulent Consumption Cure.—Tuberculene has been exploited from Danville, Ill., by one Mrs. D. J. Murrman, under the trade name Tuberculene Mfg. Co., as a "lung restorer." A fraud order has been issued against the Tuberculene Mfg. Co., debarring it from the mails. Tuberculene was a mixture of creosote, rock candy syrup, glycerin, syrup of wild cherry and coloring matter. In the trial, the government pointed out that creosote preparations had long been used in the treatment of certain symptoms in cases of pulmonary tuberculosis, but that it has been definitely established that they do not destroy the tubercle bacilli. (Jour. A. M. A., April 3, 1926, p. 1089).

The Zoalite Lamp.—This is a device for producing radiant heat for therapeutic purposes. The heat is produced by a "resistor," which is heated by an electric current. The radiant energy emitted by this unit is not unlike the radiant energy produced by an incandescent body such as a bar of hot iron or the filament of a tungsten lamp. The therapeutic value of the Zoalite is precisely that of other sources of radiant heat. (Jour. A. M. A., April 3, 1926, p. 1091).

Gonococcus Vaccine.—It is probable that gonococcus vaccine in some form or other is still used by physicians in the treatment of gonorrhea and its complications. There is no question, however, that this practice is far less extensive than formerly. The use of gonococcus vaccine for curative treatment appears to be sharing in the decline from popular favor of bacterial vaccines in general. Gonococcus serum and gonococcus vaccine were omitted from New and Non-official Remedies because the Council on Pharmacy and Chemistry concluded that there was no evidence to show that these preparations had therapeutic value. (Jour. A. M. A., April 3, 1926, p. 1091).

Psycosulphene.—According to the manufacturer, McNickle & Co., Spring Hill, Mass., Psycosulphene is "a Product of Chemical Research," which promotes circulation through the feet, and those who are suffering from kidney trouble, run down constitution, nervous disorders are instructed to drop a small pinch into each shoe each day. Newspaper advertisements contain testimonials of the wonders which Psycosulphene is asserted to have performed. The A. M. A. Chemical Laboratory reports that from an examination it appears that Psycosulphene is composed essentially of sulphur, 5 parts; starch, 15 parts; borax, 40 parts; baking soda, 40 parts. (Jour. A. M. A., April 10, 1926, p. 1150).

Kaolin in Intestinal Disease.—For centuries Chinese physicians have used kaolin in fevers and intestinal disorders, including cholera. Recent experiments seem to confirm the scientific basis of its use. Work in vitro has demonstrated that it is not

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an antiseptic agent, but that in fluid mediums, if kept in motion, kaolin will carry down with it large numbers of bacteria. More than this, it combines with the toxic products of cholera, of the typhoid dysentery group of organisms, and, apparently, with putrefactive and proteolytic bacteria. Recent workers have successfully employed kaolin in Asiatic cholera, bacillary dysentery, chronic ulcerative colitis and acute enteritis. (Jour. A. M. A., April 17, 1926, p. 1217).

Idosan Not Acceptable for N. N. R.—Idosan is an iron preparation manufactured in Denmark. According to the distributor, Duomares Corporation, New York, the active medicinal ingredient is "colloidal iron." Though claimed to be novel, Idosan appears to be essentially similar to the colloidal ferric hydroxide preparation, which was in vogue as "dialyzed iron" many years ago. The Council on Pharmacy and Chemistry found Idosan unacceptable for New and Non-official Remedies, because the statement of its composition is indefinite and incorrect and because it is an unoriginal preparation marketed under a noninforming name. (Jour. A. M. A., April 17, 1926, p. 1233).

Benzyl Benzoate for Therapeutic Use—VanDyk & Co., Twenty Per Cent Aromatized Suspension Made from Benzyl Benzoate (VanDyk & Co.), and Benzyl Alcohol—VanDyk & Co.

Omitted From N. N. R.—The Synthetic Drug Corporation (formerly the United Synthetic Chemical Corporation), markets a brand of benzyl benzoate—Benzyl Benzoate for Therapeutic Use (VanDyk & Co.)—and a preparation of it—Twenty Per Cent Aromatized Suspension of Benzyl Benzoate (VanDyk & Co.) The advertising for these was based on the enthusiastic reports that were published when benzyl benzoate was first used experimentally in medicine. In consideration of the revised estimate of benzyl benzoate, the Council on Pharmacy and Chemistry urged the distributor of these preparations to revise the advertising claims. This revision was not made and, therefore, the preparations have been omitted from New and Non-official Remedies. Benzyl Alcohol—VanDyk & Co., was accepted for New and Non-official Remedies as a brand of benzyl alcohol—N. N. R. Recently, the distributors—Synthetic Drug Corporation—have adopted the name, "Benzylol" for it and claim this name as a "word mark." The Council on Pharmacy and Chemistry omitted the product from New and Non-official Remedies because it is marketed under a name which the Council cannot recognize. (Jour. A. M. A., April 17, 1926, p. 1233).

Bismuthal Omitted from N. N. R.—Bismuthal (Langley & Michaels Co., San Francisco), is a mixture containing an insoluble bismuth citrate and pepsin as its active ingredients, with hydrochloric acid and lactic acid to protect the pepsin. It was accepted for New and Non-official Remedies in 1909, when an extended clinical practice of prescribing mixtures of a bismuth preparation and pepsin justified its acceptance. During recent years, the prescribing of pepsin in combination with other therapeutic agents has been generally abandoned. The Council omitted Bismuthal from New and Non-official Remedies on the ground that the routine combination of a bismuth compound and pepsin in the form of a stock preparation is not in the interest of rational therapy. (Jour. A. M. A., April 17, 1926, p. 1233).

Starch Digestants.—Recent studies of salivary digestion show that seventy-six per cent of the starch of mashed potatoes and fifty-nine per cent of the starch of bread was converted to maltose, an additional percentage being changed to dextrin. If food is properly masticated and starch digestion allowed to proceed fifteen minutes or so in the stomach, almost as much starch is broken down as when digestion can proceed for a long time. For this the high amylase content of saliva is responsible. The use of amylase preparations in medicine has lost its former vogue. With starch presented in readily digested form, there is little need for salivary digestants—that is, the responsibility for proper digestion of starch is being transferred to the technique of the food factory and the kitchen instead of the purveyor of digestive ferments. (Jour. A. M. A., April 24, 1926, p. 1288).

Book Announcements

Fortieth Annual Report of the Bureau of American Ethnology. To the Secretary of the Smithsonian Institute. 1918-1919. Washington. Government Printing Office. 1925. 664 pages. Cloth.

Medical Diagnosis for Student and Practitioner. By CHARLES LYMAN GREENE, M. D., St. Paul. Formerly Professor of Medicine and Chief of Medical Clinic in the University of Minnesota; Chief of Staff, St. Luke's Hospital; Consulting Physician, State Hospital for Crippled and Deformed Children, etc. Sixth Edition, Revised and Enlarged. Philadelphia. P. Blakiston's Son & Company, 1012 Walnut Street. 1926. 8vo. 1,468 pages, with 14 colored plates and 709 other illustrations. Cloth. Price, $12.00.

Facts on the Heart. By RICHARD C. CABOT, M. D., Professor of Medicine and of Social Ethics at Harvard University. Philadelphia and London. W. B. Saunders Company. 1926. Octavo of 781 pages with 163 illustrations. Cloth. Price, $7.50 net.

Clinical Features of Heart Disease. By LEROY CRUMMER, M. D., Professor of Medicine, University of Nebraska. An Octavo book of 353 pages. This was announced in our June, 1925, issue. The publishers, Paul B. Hoeber, Inc., New York City, state that the price, formerly $3.00, is now $4.00.

Gould and Pyle's Pocket Cyclopedia of Medicine and Surgery. Based upon the Fourth Edition of Gould and Pyle's Cyclopedia of Practical Medicine and Surgery. A Useful Book of Reference. Third Edition, revised and enlarged, and edited by R. J. E. SCOTT, B. C. L., M. D., Fellow of the New York Academy of Medicine; formerly Attending Physician to the Bellevue Dispensary; Editor of several books, etc. Philadelphia. P. Blakiston's Son and Company, 1012 Walnut Street. 922 pages. Leather. Pocket size. Price, $2.50 for plain and $3.00 for thumb index.

Young's Practice of Urology. Based on a study of 12,500 cases. By HUGH H. YOUNG, M. D., and DAVID M. DAVIS, M. D., Johns Hopkins University. With the collaboration of FRANKLIN P. JOHNSON. Two octavo volumes, totalling 1,484 pages with 1,003 illustrations, 20 being color plates by WILLIAM P. DIDUSCH. Philadelphia and London. W. B. Saunders Company. 1926. Per set: Cloth, $25.00 net.

Handbook of Diseases of the Rectum. By LOUIS J. HIRSCHMAN, M. D., F. A. C. S., Ex-Chairman, Section on Gastro-Enterology and Proctology, A. M. A.; Professor of Proctology, Detroit College of Medicine, etc. Fourth Edition Revised and Re-written. St. Louis. The C. V. Mosby Company. 1926. 8vo. 403 pages with 252 illustrations, mostly original, and five colored plates. Cloth. Price, $6.50.

Modern Methods of Amputation. By THOMAS G. ORR, M. D., F. A. C. S., Professor of Surgery, University of Kansas. St. Louis. The C. V. Mosby Company, 1926. 8vo. of 117 pages, with 125 illustrations. Cloth. Price, $3.50.

Therapeutics, Materia Medica and Pharmacy. The Special Therapeutics of Diseases and Symptoms, the Physiological and Therapeutical Actions of Drugs, the Modern Materia Medica, Official and Practical Pharmacy, Prescription Writing, and Antidotal and Antagonistic Treatment of Poisoning. By SAM'L O. L. POTTER, M. D., M. R. C. P. London. Formerly Professor of the Principles and Practice of Medicine in the Cooper Medical College of San Francisco; Author of the "Quiz Compends of Anatomy and Materia Medica," etc. **Fourteenth Edition.** Revised by R. J. E. SCOTT, B. C. L., M. D., New York, Fellow of the New York Academy of Medicine; Editor of various books. Philadelphia and London. P. Blakiston's Son and Company, 1012 Walnut Street. 8vo. of 972 pages. Cloth. Price, $8.50.

Diseases of the New-Born. A Monographic Handbook. By JOHN A. FOOTE, M. D., Professor of Diseases of Children, Georgetown University Medical School. Including chapters by Prentiss Willson, M. D., James M. Moser, M. D., William F. O'Donnell, M. D., Frederick J. Eichenlaub, M. D., and John F. O'Brien, M. D., of the Faculty of Georgetown University Medical School, Philadelphia, London and Montreal. J. B. Lippincott Company. 8vo. of 231 pages with 85 illustrations. Cloth. Price, $5.00.

The Thyroid Gland. By CHARLES H. MAYO, M. D., Professor of Surgery, University of Minnesota, Mayo Foundation, Rochester, Minn., and HENRY W. PLUMMER, M. D., Professor of Medicine, University of Minnesota, Mayo Foundation, Rochester, Minn. Series Number Four of the Beaumont Foundation Lectures. Given under the auspices of the Wayne County Medical Society, Detroit, Michigan, 1925. Published April, 1926, by the C. V. Mosby Company. St. Louis. Small 8vo of 83 pages. Cloth. Price, $1.75.

The International Medical Annual. A Year-Book of Treatment and Practitioner's Index. By a number of contributors. Forty-Fourth Year. 1926. New York. William Wood and Company. 8vo of 555 pages. Cloth. Price, $6.00.

Parenthood and the Newer Psychology. Being the Application of Old Principles in a New Guise to the Problems of Parents with Their Children. By FRANK HOWARD RICHARDSON, M. D., Author of "Simplifying Motherhood," "Malnutrition and the Child," etc. G. P. Putnam's Sons. New York and London. The Knickerbocker Press. 1926. 8vo of 200 pages. Cloth. Price, $1.75.

Text-Book of Materia Medica for Nurses. Compiled by LAVINIA L. DOCK, R. N., and JENNIE C. QUINBY, R. N. Eighth Edition, Re-written and Revised according to the Standard Curriculum. G. P. Putnam's Sons. New York and London. The Knickerbocker Press. 1926. 8vo of 317 pages. Cloth. Price, $2.25.

Diseases of the Skin. By RICHARD L. SUTTON, M. D., LL. D., F. R. S. (Edin.), Professor of Diseases of the Skin, University of Kansas School of Medicine; Dermatologist to the Atchison, Topeka and Santa Fe Hospital Association, and to the Christian Church Hospital. Sixth Edition. Revised and enlarged. St. Louis. C. V. Mosby Company. 1926. 8vo of 1303 pages, with 1147 illustrations and 11 colored plates. Cloth. Price, $12.00.

Collected Papers by the Staff of the Henry Ford Hospital. (First Series, 1915-1925). Paul B. Hoeber, Inc., Publishers. New York City. 1926. 8vo of 634 pages, with 151 illustrations and 42 charts. Cloth. Price, $8.00.

A Manual of Normal Physical Signs. By WYNDHAM B. BLANTON, M. D., Richmond, Virginia. Associate in Medicine, Medical College of Virginia. St. Louis. The C. V. Mosby Company. 1926. Small, 8vo. of 215 pages. Cloth. Price, $2.50.

Materia Medica and Therapeutics, Including Pharmacy and Pharmacology. By REYNOLD WEBB WILCOX, M. D., LL. D., D. C. L., Professor of Medicine (Retired) at New York Post-Graduate Medical School and Hospital; Consulting Physician to St. Mark's, to the Nassau, to the Ossinning, to the New Jersey State, and to the Eastern Long Island Hospital; Fellow of the American Association for the Advancement of Science, etc. Eleventh Edition. Revised in Accordance with the **U. S. Pharmacopoeia, X,** with **Index of Symptoms and Diseases.** Philadelphia. P. Blakiston's Son & Co., 1012 Walnut Street. 1926. 8vo. of 798 pages. Cloth. Price, $5.00.

A Bipolar Theory of Living Processes. By GEORGE W. CRILE. Edited by AMY F. ROWLAND. New York. The Macmillan Company. 1926. 8vo of 405 pages. Cloth.

Nursery Guide for Mothers and Children's Nurses. By LOUIS W. SAUER, Ph. D., M. D., Senior Attending Pediatrician, Evanston Hospital; formerly Attending Physician Chicago Infant Welfare, and Assistant Attending Physician Children's Memorial Hospital, Chicago. Second Edition. St. Louis. The C. V. Mosby Company. 1926. 12mo of 206 pages, illustrated. Cloth. Price, $2.00.

Public Health in Russia.

Three hundred and ninety-five million gold rubles for public health work during the current fiscal year is provided for in the budget of the Union of the Soviet Socialist Republics and those of the federated states, according to Isviestia of Moscow. This sum is twice as large as that provided in 1923-24. Isviestia further reports the establishment in Ukrainia in 1925 of twenty-four infant consultations in cities, 177 in rural districts, sixty day nurseries in cities, 324 in rural districts and eighteen milk kitchens. In Kharkov, Kiev, Odessa, and Ekaterinsolav, day nurseries were established for the care of children of university students.

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Editorial

Rheumatism and Focal Infection.

"The throttling quinsey, 'tis my star appoints,
And rheumatisms I send to rack the joints."
Dryden: Palamon and Arcite.

Rheumatism, whatever the term originally meant, today is as much as ever a problem of internal medicine. Now, the term rheumatism, used in the light of present-day knowledge, carries a wide range of disease entities. But the basic thought, tied up in the primary cause and varied lines of pathology and symptomatology found in the general body, seems to warrant a comment on the fundamentals of this widespread complaint. If Dryden was able to guess the relation of the "throttling quinsey" to the "rheumatisms," which "rack the joints," long before science had, by proof, shown the relationship, the profession of today, in the light of present-day facts of this relationship, may well accept the establishment of this clinical association. Besides, physicians and specialists may well get together upon a common understanding of the fundamentals of the origin of "rheumatisms" wherever found. "Rheumatisms," as used by Dryden, may not be alone arthritis; may not be alone endocarditis; may not be alone herpes zoster; may not be alone iritis. "Rheumatisms," arising from one or several primary regions, may show pathologic changes that set up various symptoms of more or less special character according to the function and anatomy of the system, organs or structures involved. Pain, however, may be said to be the chief symptom in all rheumatisms that bring the patient limping and complaining to the physician.

Young tonsils, young hearts, young joints, appear to be particularly prone to a spectacular type of rheumatism which has been given various titles, such as acute rheumatic fever, acute inflammatory rheumatism, and acute articular rheumatism. The portal of entrance of organisms (for it is accepted now to be of microbic origin) is usually the oral or nasal orifice, and the site of usual primary implantation, and the propagation, at least to gross examination, is the tonsil. This phase of the disease may be lacking in striking symptoms, but clinical observation and the trend of modern opinion of the disease is, that here in the tonsil or neighboring structures, the earliest pathology of rheumatic fever, or articular rheumatism of a later period of the same general infection, is located. It is reasonable to think that tonsillitis is a negligible factor in the etiology in some cases of rheumatic fever because of the apparent absence of disease of the tonsils when first examined by the attending physician, and when, so often, patients and parents disclaim knowledge of an antecedent tonsillitis. This point may be well made in some cases. But in all, except a small proportion of cases, possibly, tonsil infection is an initial step to acute rheumatic arthritis.

Acute Rheumatic Fever in Children and Young Adults.

The specific cause of rheumatic fever is not easy to absolutely determine, especially if this means the identification of a specific organism. In fact, scientific procedure, according to the postulates of Koch who laid down the rules for scientific investigation, can not be satisfied in acute rheumatic fever. The specific germ has not been identified. The claims, according to Swift, of certain bacteriologists to the discovery of a specific organism as a cause of rheumatic fever have been refuted by certain other workers, based upon their work and conclusions. For the present, it seems that the identity of the specific etiologic organism is not proven. The streptococcus has, however, received serious and weighty consideration because of frequent and close affinity to the pathologic processes of the disease. But advocates of the streptococcus as the specific organism have been met by antagonists who have been unable to verify

such conclusions. The bacteriologic controversy goes on; "the causative agent of the disease has not been finally determined." But we know that rheumatic fever and active tonsillitis are commonly associated; we know that tonsillitis and endocarditis are commonly associated; we know that youth and young adult life is the usual age in which these associated diseases occur.

The Symptoms

I. Arthritis; II. Fever; III. Sweating; IV Heart.

Arthritis.—The disease first displays itself emphatically in the joints, in association with fever. Pain and tenderness in one or more joints, disclosing signs of acute inflammation, are evident in one or more joints. With early loss of function, involved joints evince pain, tenderness, swelling, redness, and local heat. Pain is usually the precursor of the other signs. The duration of the signs of inflammation in the affected joints varies from a few days to six or eight weeks. Following the passing of the violent symptoms, the joint function is tardy in returning to normal function; showing stiffness and pain on action. Malshapened joints result from prolonged inflammation or from dual infection, in some cases.

The migratory nature of the arthritis affords an interesting subject for speculation and comment. It seems to be true, from our observation, that joints more subject to trauma and overuse are the earliest in showing arthritic inflammation; subsequent migration to neighboring joints seems to be more usual than otherwise.

Fever.—Without the effect on complications, the febrile course of inflammatory rheumatism is rather uniform. Beginning with a high fever of 103-4 F., it may remit to 101-2 F., during the course of a day. The febrile course is carried on by the involvement of one joint after another, as the joint infection spends itself at one site and the infection is taken to neighboring joint structures. In this manner through six weeks, febrile reactions emanate from involved joint infections. The uncomplicated arthritis is self-limited and tends to ultimate recovery without serious pathologic changes. But if the temperature curves act "queerly" either by persistence of fever for weeks or a month, with or without relapsing, one may suspect infection in other structures, besides arthritis.

Sweating.—Sweating, with a high objectionable and characteristic odor, marks the course of the disease. Severe and saturating sweats characterize the febrile course and form a phenomenon of importance to the nursing as well as the medical side of the case.

Heart.—Heart damage is a frequent complication of articular rheumatism. This damage may be in the myocardium as well as in the endocardium. The electrocardiograph study of heart action during and subsequent to acute stages of rheumatic fever, emphasizes, latterly, the serious injury suffered by the heart muscle, although endocaritis as a complication stands out as the chief fear of clinicians. The occurrence of serious myocardial degeneration takes place usually at the same time and by the same token. The onset of endocarditis, however, is the chief concern of the practitioner as he manages the treatment of rheumatic fever. The occurrence of systolic murmurs requires interpretation in order to obtain an early insight into the pathologic complications in the heart. Is the systolic murmur coming into the clinical picture, the expression of an endocarditis or myocarditis? Diastolic murmurs, too, must receive careful interpretation. Arrhythmia and tachycardia, extrasystoles, cyanosis, and other ominous signs are harbingers of grave cardiac complications. The heart, during and following rheumatic fever, demands careful scrutiny and judgment.

Enough has been hinted at to recall the general and constitutional effect of the infection called acute rheumatism.

Focal Infection and "Rheumatisms."

Chronic focal infection and chronic systemic disease is accepted also by present-day clinicians as an indisputable relationship, easily illustrated in the ordinary experience of daily practice. No more epochal advance in internal medicine has been achieved than the acceptance of this disease relationship. Much of chronic disease may be prevented; many "time-worn" symptoms may be relieved by the discovery and removal of the primary focus of infection, when the body is systemically affected by "rheumatisms" of one sort or another. The internist has a potent effect upon chronic "rheumatisms" by his laying bare the origin, and by removing same. Much the same

comes to his aid in restoring the body to easy function by the removal of the primary focus, as comes to the aid of the surgeon when he removes from the body offending pathology. If an appendix suppurates, its excision and drainage enable the body to return to normal. If one suffers herpes zoster, and infected tonsils (the probable cause) are extirpated, one quickly improves and returns to normal. All primary infection should be removed or drained off in order that the secondary depots may be better overcome by the "constitutional powers."

From chronic focal infections of the mouth and throat and the auxiliary sinuses, one may expect a wide range of systemic disease.

What are some of these "rheumatisms" setting up, in the general system, as the result of more or less chronic focal infection in the mouth, throat and auxiliary sinuses?

Acute chorea is one. This affection is of microbic origin. It produces choreic muscular movements, mental disturbances, endocarditis and anemia.

Thyroiditis is another. Acute and chronic thyroiditis give evidence of enlargement and serious disturbance of the function of the thyroid. The writer recalls a case of acute thyroiditis, secondary to acute tonsillitis, which ran a septic course to a fatal termination in ten days. The thyroid was extremely large and tender and the patient delirious to the end.

Acute and chronic iritis is another. What clinician has not seen in practice numbers of these cases? Only the removal of the primary focus enabled the eye to come back to fair condition.

Erythema nodosa is another. These polymorphic skin lesions are quite common in rheumatic fever. But they are also seen in chronic infection of the mouth or throat. The removal of the septic foci in our experience has uniformly brought recovery. One has only to recognize the relationship and to remove the primary focus in order to do much toward relieving the suffering patient.

Gonorrheal rheumatism is another. In no way may an illustration of this relationship be better brought forward. After an urethral infection with specific organism, the patient suffers a systemic "rheumatism" or arthritis which cripples him. This we call gonorrheal rheumatism.

Finally, arthritis and glomerulo-nephritis may find primary causes back in the chronic tonsillar or other focal infection.

Illegal Chiropractors.

Members of the profession in every locality of the State will be interested in the following synopsis of the proceedings and results obtained in the case violation of the "Medical Practice Act" by an illegal chiropractor. Not only does such action give satisfaction to the local profession in Richmond, but also serves as an example of what may be accomplished in any locality or community under like circumstances. It seems only necessary for the profession to initiate action, in the case of known transgressors of this act, by bringing to the attention of the Commonwealth's Attorney the identity of persons known to be violating this law, in order to get an arraignment before the proper court. This officer of the State in Richmond, assisted and supported by a zealous member of the local profession, secured the conviction of the offender in due course.

The work done in Richmond should be commended and applauded by the profession for the successful attack upon pernicious and illegal practitioners, not so much for the good that will accrue to regular medicine, as for the great protection of the public against vicious and malevolvent methods of endless harm and danger.

SYNOPSIS OF PROCEEDINGS VS. MISS REMA M. KING, OF RICHMOND, VA.

Proceedings against Miss Rema M. King, Richmond, Va., in the Hustings Court of the City of Richmond, pertaining to her practicing medicine in violation of Section 1618, Code of Virginia, 1919, known as the "Medical Act," Chapter 68. A copy of the records of the Hustings Court, as attested by Walter Christian, clerk, follows:

July 18th, 1925, City of Richmond vs. Miss Rema M. King. Appealed from Police Justice Court, doing business without license. Prosecuted by the City Attorney and his assistant, and tried before a jury whose verdict was: "We the jury find the defendant guilty of practicing without a license and fix a fine of $10 00 and cost." Miss King's attorneys entered a motion to appeal the motion to the Supreme Court of Appeals of Virginia, and at the same time giving bond for $250.00 to the court for recognition on October 5, 1925. Before October 5th, Miss King, with her attorney, appeared in court and paid the fine of $10.00 and cost.

In the Hustings Court of City of Richmond, Va., January 14, 1926: The Commonwealth vs. Miss Rema M. King. Appealed from Police Court, for practicing medicine without a license. Prosecuted by the Commonwealth's Attorney, and a jury returned a verdict as follows: "We the jury find the accused guilty as charged and fix her punishment at a fine

of $50.00 and cost." January 15, 1926, the defendant appeared in court and paid the fine of $50.00 and costs.

In the Hustings Court of City of Richmond, February 19, 1926: Commonwealth vs. Miss Rema M. King. Appealed from Police Court, practicing medicine without a license. Tried before a jury and prosecuted by the Commonwealth's Attorney, which jury returned a verdict as follows: "We the jury find the accused guilty and fix her punishment in a fine of $300.00 and cost." The defendant, through her attorney, appealed the decision of the court, whereof a bond of $250.00 was required by the court for Miss King's appearance in court on February 25, 1926.

March 13, 1926: The defendant appeared in court and was allowed to withdraw the motion to set aside the verdict of the jury, which was rendered on the 19th day of February, 1926, and Miss Rema M. King did pay to the court the fine of $300.00 and cost.

In the Hustings Court of City of Richmond, Va., April 19, 1926: Commonwealth vs. Rema M. King. Appealed from Police Justice's Court, practicing medicine without license: "A nolle prosequi is entered by the Attorney for the Commonwealth, with the leave of the court, in this case," to the effect that Miss King would not practic chiropractor manipulation in the State of Virginia, nor advertise herself in any way or manner, and was cautioned to remove all signs and advertisements pertaining thereto.

Miss Rema M. King obtained a license from the Commissioner of Revenue on May 1, 1926, to practice massage; which was granted.

On the first two appearances of Miss Rema M. King in Police and Hustings Court, and at the same time a similar warrant was issued against one C. McConney, a colored chiropractor practitioner. McConney was fined in both instances by the Police Court Justice and the case was appealed by his attorneys to the Hustings Court. His first appeal was not gone into, because of the disposition of the case against Miss Rema M. King. Upon his second appeal in Hustings Court, he agreed to leave the State, which he did.

At the present time there are no chiropractor practitioners practicing medicine in Richmond in violation of the State law pertaining to the practice of medicine.

News Notes

Medical College of Virginia Finals.

The closing exercises of the Medical College of Virginia, this year, were of more than usual interest. They opened with the usual "Stunt Night" by the students, on Saturday, the 29th of May, and from that time to the closing exercises, there was something of interest and pleasure for the alumni as well as the new graduates. The baccalaureate sermon was preached by Rev. Beverley Tucker, D. D., at St. Paul's Episcopal Church.

The outstanding feature of this year's exercises was the installation of William Thomas Sanger, Ph. D., as president of the College. The faculty and students, all capped and gowned, marched from the College through the Capitol Square to the Lyric Theatre, where the inaugural exercises were held on May 31st, at 11 o'clock. Music for this occasion was furnished by the College Orchestra. In the early part of that afternoon, Dr. Sanger, the new president, held a public reception at the Richmond Hotel, and this was followed at 6:30 by an Alumni-Inauguration dinner at Commonwealth Club.

The annual Alumni Association meeting was held on June 1st, with Dr. Greer Baughman, Richmond, the president, in the chair, and Mr. L. C. Bird, also of Richmond, at the secretary's desk. Officers elected for the coming year are: President, Dr. Charles Phillips, Richmond; vice-presidents, H. F. Sommarbahl, D. D. S., Roanoke; James H. Smith, M. D., Richmond; Mr. H. T. Haley, Tazewell; and Miss Hildred Bauserman, Richmond; treasurer, Dr. F. H. Beadles, Richmond. The secretary, as usual, is to be named by the executive committee.

Following the meeting of the alumni, there was an old-fashioned Brunswick stew, with later a baseball game between the seniors and alumni faculty, with medical and dental clinics for the more sober-minded.

At 8 P. M., June 1st, were held the final exercises at the City Auditorium, on which occasion, the address of the evening was made by Rolvix Harlan, Ph. D., of the University of Richmond. The presentation of diplomas and conferring of degrees was by the deans of the various schools. Exercises were brought to a close with the annual reception and dance at the Commonwealth Club. There were 81 graduates in medicine, 16 in dentistry, 34 in pharmacy, and 16 in nursing.

The list of graduates in the School of Medicine, with hospital appointments already announced, follows:

Memorial Hospital, Richmond—Drs. Webster Barnes, Gargatha; James R. Bailey, Keysville; Frazier C. Bedsaul, Galax; O. C. Campbell, Princeton, W. Va.; John M. Crymes, South Hill; J. Frank Folk, Durbin, W. Va.; J. Romond Grinels, Grinels; A. A. Karan, Brooklyn, N. Y.; John J. McDonald, Richmond; Donnie M. Royal, Salemburg, N. C.; Maurice Rosenthal, Richmond; Jos. K. Rowland, Princeton, W. Va.; Henry L.

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Townsend, Manquin; Harry Walker, La Crosse; Louis Wachtel, Brooklyn, N. Y.

Johnston-Willis Hospital, Richmond — Drs. Lewis W. Angle, Rocky Mount; B. Herman Bailey, Keysville; Richard B. Easley, Richmond.

Retreat for the Sick, Richmond—Drs. William R. Morton, Oxford, N. C., and Bruce L. Randolph, St. Brides.

St. Elizabeth's Hospital, Richmond—Dr. William R. Counts, Welch, W. Va.

St. Luke's Hospital, Richmond—Dr. George O. Martin, Cullen.

Stuart Circle Hospital, Richmond—Dr. George G. Chiles, Strasburg.

Tucker Sanatorium, Richmond—Dr. James Asa Shield, Hampton.

George Ben Johnston Memorial Hospital, Abingdon—Dr. Lewis A. Law, Sandy River.

Elizabeth Buxton Hospital, Newport News—Drs. Edward L. Boone, Rich Square, N. C., and William M. Dick, Newport News.

Norfolk Protestant Hospital, Norfolk—Dr. Harry Goldstein, Erie, Pa.

St. Vincent's Hospital, Norfolk—Dr. Lawrence B. Kelleher, Richmond.

Petersburg Hospital, Petersburg—Dr. Gilbert A. Daniel, Athens, W. Va.

Lewis-Gale Hospital, Roanoke—Drs. Frederick F. Davis, Roanoke, and Walton F. Mitchell, Stewartsville.

Franklin Square Hospital, Baltimore, Md.—Dr. Allen W. Kelly, Taneytown, Md.

St. Agnes Hospital, Baltimore, Md.—Dr. William P. L. McBride, Hampton.

Mercy Hospital, Baltimore, Md.—Dr. Emory V. Jordan, Charleston, W. Va.

Beth Moses Hospital, Brooklyn, N. Y.—Dr. Morris Thomas, Brooklyn, N. Y.

Charleston General Hospital, Charleston, W. Va.—Dr. Thomas Braxton Gordon, Appomattox.

Mountain State Hospital, Charleston, W. Va.—Dr. Roy M. Rhodes, Williamson, W. Va.

McMillan Hospital, Charleston, W. Va.—Dr. William F. Work, Blue Creek, W. Va.

Eloise Hospital, Detroit, Mich.—Dr. A. J. Hollander, Brooklyn, N. Y.

Cumberland General Hospital, Fayetteville, N. C.—Dr. Ernest C. Bennett, Clinton, N. C.

Hazelton General Hospital, Hazelton, Pa.—Drs. Guy C. Amory, Grafton, and Harvey Lee Griffin, Fairmont, N. C.

Gouverneur Hospital, New York, N. Y.—Dr. Clifton W. Henson, Richmond.

Grasslands Hospital, Valhalla, N. Y.—Dr. Hugh O. Pearson, Wilson, N. C.

Harlem Hospital, New York, N. Y.—Dr. Pasquale F. Montilli, New York, N. Y.

Naval Hospital, New York, N. Y.—Dr. Jos. Berkeley Gordon, Richmond.

Ancon Hospital, Ancon, Canal Zone—Dr. Lewis C. Lush, Winterpock.

St. Margaret Hospital, Pittsburgh, Pa.—Dr. George B. Hudock, Oliver, Pa.

Pittsburgh Hospital, Pittsburgh, Pa.—Dr. Helen Magley, Cincinnati, Ohio.

Rex Hospital, Raleigh, N. C.—Drs. William H. Drewry, Drewryville, and Rupert R. Weathers, Wendell, N. C.

St. Mary's Hospital, Rochester, N. Y.—Dr. J. Howard Childrey, Dumbarton.

Mayo Clinic, Rochester, Minn.—Dr. Grace B. Rollins, Richmond.

Letterman General Hospital, San Francisco, Cal.—Drs. Fletcher E. Ammons, Hampton, and James B. Smith, Jr. Sharps.

St. Luke's Hospital, San Francisco, Cal.—Drs. Andrew S. Davis, Chincoteague Island, and Gordon Hastings, Emporia.

Presbyterian Hospital, San Juan, Porto Rico—Drs. R. R. Molina and Luis M. Morales, both of San Juan, Porto Rico.

Guyan Collieries Corps Hospital, Tamcliff, W. Va.—Dr. Jack Smiley, Salem.

Walter Reed General Hospital, Washington, D. C.—Drs. Richard A. Bowen, II, South Richmond, and Marion W. Ransone, Hampton.

Welch General Hospital, Welch, W. Va.—Dr. Edward W. Wood, Claremont.

City Memorial Hospital, Winston-Salem, N. C.—Dr. John C. Sasstevens, Hamptonville, N. C.

West Palm Beach Sanatorium, West Palm Beach, Fla.—Dr. Marion H. Seawell, Richmond.

Gordon Keller Hospital, Tampa, Fla.—Mr. Louis S. Leo, undergraduate.

James Walker Memorial Hospital, Wilmington, N. C.—Mr. W. S. Jones, undergraduate.

City Home Hospital, Richmond—Messrs. E. J. Haden, E. C. Jamison and P. A. Shelburne, undergraduates.

City Jail Hospital, Richmond—Mr. Percy P. Pharr, undergraduate.

Grace Hospital, Richmond—Messrs. John W. Parker and Sidney Johnston, Richmond, undergraduates.

Hygeia Hospital, Richmond—Mr. Seth Gayle, Jr., undergraduate.

Other graduates in medicine are:

Dr. Hadden C. Alexander, Jr., Tunstall.
Dr. Abram J. Blechman, Baltimore, Md.
Dr. William T. Burch, McDonough, Md.
Dr. Harvie D. Coghill, Richmond.
Dr. James E. Feraca, New York, N. Y.
Dr. Ashby D. Ferrell, Talcott, W. Va.
Dr. Edward W. Gray, Richmond.
Dr. S. E. Gunn, Sutherland.
Dr. James P. Jones, Jr., Richmond.
Dr. William J. Killius, Charleroi, Pa.
Dr. Max Kliger, New York, N. Y.
Dr. Thomas L. Lee, Kinston, N. C.
Dr. Jeannette T. Morris, Gainesville, Fla.
Dr. Aaron B. Spahr, Benhams.
Dr. Frank B. West, Vesta.

Koch's "Cancer Antitoxin."

As a number of inquiries have been made by our members relative to the so-called Koch's "Cancer Antitoxin," it seems to us wise to publish at this time an abstract of the statement made concerning it by the American Medical Association, under the heading of "Propaganda for Reform," in the May 8, 1926 issue of the *J. A. M. A.*, pages 1469-1472.

In 1918, William F. Koch, of Detroit, was graduated in medicine by the Detroit College of Medicine and Surgery. Less than a year after his graduation in medicine, Dr. Koch announced that he had "developed a real specific cure for cancer." Seven years have passed during which Dr. Koch has seen fit to keep the composition of his preparation to himself. During that time, *The Journal of the American Medical Association* has been unable to learn of a single instance in which a case of unquestioned malignant disease has been cured by the Koch treatment. On the other hand, information was received regarding individuals who "promptly died" after taking the treatment. At different times, the Wayne County (Detroit) Medical Society has appointed three committees to investigate Koch's cure. Each of the three reports has been unfavorable.

The Koch treatment has been commercialized and it seems evident that large sums of money have been spent in circularizing the profession and the public in the interest of the "cure." The latest move is the establishment of the imposingly named "Koch's Cancer Foundation," with William F. Koch as "director."

There has also been organized "Koch Laboratories, Inc.," which is the sole owner and manufacturer of what Koch calls his "antitoxin." It seems that, while stockholders and members pay $110 for the treatment, patients are charged $300 for the first treatment and $200 for any afterward. The difference between the price charged the Koch disciples and the price the disciples charge the victim is presumably to cover the risk assumed by the followers of Koch in injecting his secret mixture into the cancer patient.

Facts with regard to Koch's "Cancer Antitoxin" have been discussed in the *Journal of the American Medical Association* at different times and the matter, which has been arranged in reprint form, is available to any one who will send the publishers a self addressed, stamped envelope for it.

The Norfolk Meeting.

Summer has come and almost by the time that leaves us, the Norfolk meeting of the Medical Society of Virginia will be upon us. Dr. R. Lloyd Williams, chairman of the Local Committee in charge of Arrangements for our meeting, is lining up his workers and is already beginning to "count noses." Whenever that is done, it means a good time is being planned, so save part of your vacation for Norfolk, October 12, 13, 14 and 15.

Dr. W. L. Harris, of Norfolk, president of the Society, has been fortunate in securing three guests who will add greatly to the interest of the sessions. They are Dr. Walter Wells, who will perhaps speak on the first evening on "The Last Illness and Dealth of Washington"; Dr. F. C. Mann, of the Mayo Clinic, Rochester, Minn., who will have a prominent part in the symposium on "The Liver"; and Dr. Roger H. Dennett, of New York City, who will present a paper on a pediatric subject.

There is talk of an osyster roast for the men and something equally as attractive for the ladies, so prepare for the usual good time in Norfolk.

Appointments on Medical Examining Board of Virginia.

Governor Byrd has recently made the following appointments to the Virginia State

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Board of Medical Examiners, for a period of four years: Dr. J. H. Ayres, Accomac; Dr. P. St. L. Moncure, Norfolk; Dr. H. U. Stephenson, Richmond; Dr. Fletcher J. Wright, Petersburg; Dr. I. C. Harrison, Danville; Dr. J. W. Preston, Roanoke; Dr. P. W. Boyd, Winchester; Dr. Lewis Holladay, Orange; Dr. F. H. Smith, Abingdon; Dr. Robert Glasgow, Lexington. Dr. G. W. Johnson, Danville, and Dr. E. H. Shackleford, Richmond, were reappointed the homeopathic and osteopathic members of the board, respectively.

The Walter Reed Medical Society

Held an interesting two days' session at Monument Lodge, Yorktown, Va., May 20th and 21st, with an unusually large attendance. The president, Dr. R. R. Hoskins, of Mathews, presided. Several interesting papers were presented by members and invited guests, all of which were discussed. On the first day, a boat ride was enjoyed by those in attendance. On the second day, the meeting opened with the reading of a paper and a demonstration of patients at Fort Eustis, after which members adjourned to Yorktown to complete the program.

The election of officers for the coming year resulted as follows: President, Dr. J. W. C. Jones, Newport News; vice-presidents, Drs. J. M. Henderson, Williamsburg; E. M. Easley, Bacons Castle; S. G. Cook, Yorktown; J. W. Smith, Hayes Store; and W. R. Gwathmey, Ruark; secretary, Dr. L. E. Stubbs, Newport News; and treasurer, Dr. J. E. Marable, Newport News, both of the latter being re-elected. Dr. H. D. Howe, Hampton, was elected delegate to the Norfolk meeting of the State Society, with Dr. L. E. Stubbs, of Newport News, as alternate.

It was decided to have Yorktown as a permanent place of meeting, owing to the fact that is about the geographical center of the section included in this Society. The next meeting will be held in the Spring of 1927.

The Medical Association of the Valley of Virginia

Met in Harrisonburg, Va., May 27th, with an attendance of about seventy-five. Six new members were received at this meeting. Dr. P. W. Boyd, Winchester, the president, presided, and Dr. A. F. Robertson, Jr., Staunton, acted as secretary. Interesting papers were read by members and by invited guest, Dr. Hugh H. Young of Baltimore, who, by the way, was a native of Rockingham County, Virginia. Dr. Robertson, upon request of the members, agreed to act as secretary until the annual meeting, as Dr. M. P. Jones, Churchville, duly elected secretary, was unable to serve and has since died. The next meeting is to be held in Staunton, on September 23rd.

Dr. and Mrs. J. C. Coulter

And daughter, Charlottesville, Va., returned the middle of May, from Pittsburgh, Pa., where Dr. Coulter was called on account of the illness and death of his father. His mother returned with him and will make her home with Dr. Coulter.

Mrs. Southgate Leigh,

Norfolk, Va., was elected chairman of the Committee in charge of Entertainment for the Women during the meeting of the American Medical Association in Washington, D. C., in the Spring of 1927.

The American Roentgen Ray Society

Held its annual sessions in Detroit, Mich., May 17-21, inclusive, with headquarters at the Book-Cadillac Hotel. A most excellent program had been arranged by the president, Dr. Russell D. Carman, of Rochester, Minn., who, to the regret of all, was unable to attend. In his absence, the first vice-president, Dr. P. F. Butler, of Boston, presided.

On the 19th, the members were taken by busses to Anne Arbor, where an all day session was held at the University of Michigan. An excellent program was arranged for that day by Dr. Preston M. Hickey, professor of Roentgenology at the University of Michigan.

Officers elected for the ensuing year are: President-elect, Dr. Alexander Howard Pirie, Montreal, Canada; vice-presidents, Drs. P. F. Butler, Boston, Mass., and E. L. Jenkinson, Chicago; secretary, Dr. Charles L. Martin, Dallas, Texas; treasurer, Dr. W. A. Evans, Detroit, Mich.; new member of the executive council, Dr. George W. Grier, Pittsburgh, Pa. Both Louisville, Ky., and Montreal, Canada, were suggested as the next place of meeting, so it was left to the executive council to name the place.

Tennessee State Medical Association.

At the annual meeting of this Association in Memphis, in May, Dr. Ernest R. Zemp, Knoxville, was elected president, and Dr. Joseph F. H. Gallagher, Nashville, secretary-editor.

Dr. and Mrs. W. P. Burton,

Boissevain, Va., are receiving congratulations upon the birth of a daughter on May 23.

The American Surgical Association

Held one of the best meetings in its history in Detroit, Mich., in May, and selected Richmond, Va., for its 1927 meeting. Dr. Harvey Cushing, Boston, was elected president; Dr. Robert B. Greenough, Boston, secretary; and Dr. John H. Jopson, Philadelphia, recorder.

The membership of this association is limited to one hundred and twenty-five, four of these being Virginians—Drs. J. S. Horsley, Stuart McGuire, Hugh H. Trout and Stephen H. Watts. This year, Drs. Horsley and Watts attended, and Dr. Horsley presented a paper on "The Causes of Cicatricial Contraction."

Are You Reporting Births in Your Practice?

In 1921, there were reported 70,041 births in Virginia. In 1925, there were only 61,200, or 8,841 less than four years before—this, in spite of the fact that the population has increased by many thousands during that time. The loss is chiefly among the well-to-do white population. Is this due to the fact that the women who are best able to raise good families of children are shirking their responsibilities or is it due to failure on the part of physicians to report births? To overcome the last named possibility, the Bureau of Vital Statistics is urging its registrars to require a more accurate compliance with the law to require physicians to report births within ten days, or to turn the case over to the Commonwealth's Attorney, as the law requires. Many physicians have already been fined. If you have delayed any reports, make them now.

The Hospital Association of North Carolina

Is holding its ninth annual conference and an exposition of hospital supplies and equipment at the Oceanic Hotel, Wrightsville Beach, June 10-12, just prior to the meeting of the State Society. Several hospital executives of national repute are on the program.

The Virginia Academy of Science

Held its fourth annual meeting with the University of Virginia as host. The meeting extended over two days, May 7th and 8th.

Prof. R. E. Loving, of the University of Richmond, presided and gave a most interesting presidential address on locomotive power. There were four sections: Astronomy, Mathematics and Physics; Biology; Psychology and Education; and Chemistry. All of them had interesting papers. Professor Humphreys, from the American Association for the Advancement of Science, was present and discussed several papers. A report from the Committee on Research was adopted, which includes recommendations of the Committee to appoint a permanent committee on research, and to award each year a medal or certificate for the best paper read before the annual meeting of the Virginia Academy of Science.

Out of a total membership of a little over 300, there were 175 present. It was the best session of the Virginia Academy of Science, and the program was excellently arranged and carried out. This body should be a great source of encouragement to all scientific work in Virginia, and the medical profession should be particularly interested in it. In the Section on Biology several medical papers were read, one of them on the Prevention of Pneumonia by Dr. Harry T. Marshall, of the University of Virginia, another on X-Ray Studies of the Sella Turcica by Dr. L. T. Royster, of the University of Virginia, and another on The Effects of Tissue during Hyperthyroidism by Professor Speidel.

Officers elected for the ensuing year were Dr. J. Shelton Horsley, president, and Dr. E. C. L. Miller, secretary, both of Richmond. Dr. Miller has been secretary for several years.

The next meeting will be in May, 1927, at Blacksburg, under the auspices of the Virginia Polytechnic Institute.

The Medical Society of the State of North Carolina

Is to hold its annual meeting at Wrightsville Beach, June 15, 16 and 17, under the presidency of Dr. Wm. deB. MacNider, of Chapel Hill. Dr. L. B. McBrayer, of Southern Pines, is secretary.

Dr. and Mrs. P. D. Pence,

Of St. Charles, Va., stopped for a visit to relatives in Edinburg, Va., en route to a medical meeting in Washington, D. C., in May.

The Medical and Chirurgical Faculty of Maryland,

At its annual meeting, the last of April, elected Dr. Thomas S. Cullen, president; Dr. John L. Riley, Snow Hill, first vice-president; and Dr. Joseph A. Chatard, Baltimore, secretary.

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Medical Director of Hilltop Sanitarium.

The medical staff of Hilltop Sanitarium, Danville, Va., recently decided that a concentration of authority would be wise, and the entire staff decided to change the form of administration so as to have a medical director with an advisory board of six. Dr. S. E. Huges, of Danville, was elected medical director.

The Association of American Physicians,

At its annual meeting in Atlantic City, May 4 and 5, elected Dr. Charles F. Hoover, of Cleveland, Ohio, president for the ensuing year. Dr. Francis W. Peabody, of Boston, is secretary.

Dr. Wilbur Bowman,

Petersburg, Va., was elected a delegate from the Petersburg Aerie No. 82, Order of Eagles, to the Eagles' convention in Richmond, early in June.

President Medical Veterans of World War.

Dr. Hubert Work, former president of the American Medical Association, was re-elected president of the Medical Veterans of the World War, at the annual dinner in Dallas, Texas, during the time of the A. M. A. meeting.

Medical Exhibit at Philadelphia Exposition.

The board of directors of the Sesqui-centennial Exposition in Philadelphia has appropriated $250,000 for a medical exhibit. This will include all phases of the scientific treatment of the sick and will occupy a floor space of 15,000 square feet. Prominent physicians will be in charge of the various sections.

Dr. S. R. Jordan,

Formerly of Townsville, N. C., has located in Smithfield, Va., and taken over the practice of Dr. T. H. Massey who recently moved to Suffolk, Va.

The American Gastro-Enterological Association,

At its annual meeting at Atlantic City, in May, elected Dr. Franklin W. White, Boston, president, and Dr. John Bryant, also of Boston, secretary. It was decided also to hold the 1927 meeting in Atlantic City.

Dr. Kitchin Resigns as Dean.

Dr. Thurman Kitchin, dean of Wake Forest College, School of Medicine, Wake Forest, N. C., and professor of physiology and pharmacology, has tendered his resignation, effective at the end of this session, that he may resume private practice at his former home, Scotland Neck, N. C.

Petersburg Nurses Graduate.

At the graduating exercises of the Petersburg Hospital Training School for Nurses, May 27, seven nurses received their diplomas. Presentation of hospital pins was made by Dr. C. S. Dodd, while Dr. George H. Reese awarded diplomas and administered the Florence Nightingale pledge.

Dr. R. H. Garthright,

Of Vinton, Va., visited relatives in Yorktown, Va., early in June.

The High Cost of Children.

It costs about $6,150 to bring up one child from, and including birth, to the age of eighteen, according to the Metropolitan Life Insurance Company, which is making a series of studies on "the value of man" based on the approximate expenditures in dollars and cents for a growing child during the non-productive period of life.

This total is reached by adding to the initial "cost of being born," estimated at $250, the sums of $2,500 for food; $1,620 for rent, reckoning the share of the child as one-sixth of the total so expended; $300 for fuel and light, $351 for furniture and household maintenance; $144 for first cost of installation of the home, and for clothing, $912 for a boy and $1,002 for a girl.

Children's Clinic, University of Virginia.

Nearly 1,000 children already are on the lists of the general child welfare clinic recently organized in connection with the pediatric department of the University of Virginia Hospital to serve the needs of the people of the mountainous section of Western Virginia and to provide a laboratory for the teaching of pediatrics to nurses and medical students. The department of psychology of the University will superintend the giving of mental tests and the department of anatomy and anthropology will study the national and racial characteristics of the patients of the clinic. The expenses of the first three years have been provided by private subscriptions and by a grant from the Commonwealth Fund.

Dr. Thomas E. Hughes,

Of Richmond, moved his offices the first of May to McGuire Clinic, this city, where he

has charge of the department of Oto-Laryngology.

Dr. S. D. McPherson,

Durham, N. C., has recently opened a private hospital in that place, known as McPherson Hospital, for the treatment of diseases of the eye, ear, nose and throat.

Dr. and Mrs. Moses Tredway,

Of Emporia, Va., have returned from New York, where Dr. Tredway has been for some time attending clinics at the New York Post-Graduate Hospital.

Dr. H. M. Rowan,

Formerly of Raphine, Va., returned from a stay in Europe, about six weeks ago, and has located at 250 West Tulpehocken Street, Germantown, Philadelphia, Pa.

Dr. and Mrs. D. Hunter Marrow,

After spending the winter at Daytona, Fla., have returned to their home at Union Level, Va.

Dr. J. Lewis Blanton,

Of the class of '24, Medical College of Virginia, has located at Fieldale, Va.

Dr. and Mrs. R. E. Chumbley

Returned to their home in Radford, Va., the latter part of May, after a visit to Richmond, where they were called on account of the illness of their daughter, who was in a local hospital.

The Graduate Nurses' Association of Virginia,

At its annual meeting in Roanoke, last month, elected Miss Martha Baylor, of Roanoke, president; Miss Lillie Walker, Roanoke, secretary; Miss Florence Bishop, Portsmouth, treasurer; Miss Agnes Randolph, Richmond, a member of the board of directors. The vice-presidents are Miss Nannie J. Minor and Miss Elizabeth Rutz, of Richmond, and Miss Carrie May Copenhaver, of Bristol.

At this meeting, it was found that $30,000 of the $50,000 which was to be raised to found a chair of nursing at the University of Virginia, was already in hand, and that $15,000 in pledges would become due not later than July 1, 1926. Those in attendance pledged the additional $5.000 and plans are on foot to present the whole amount to the University of Virginia at an early date for the establishment of a chair of nursing.

Dr. and Mrs. R. H. Dunn,

South Charleston, W. Va., were recent visitors in Staunton, Va., having come there for the birthday anniversary of Dr. Dunn's mother. Dr. Dunn is an alumnus of the Medical College of Virginia of class of '10.

Dr. Robley R. Goad,

Of the class of '25, Medical College of Virginia, was a recent visitor in Richmond, en route to his home in Richlands, Va., after a visit to Boston, Mass., and in Maine.

Dr. T. W. Hankins,

Fordwick, Va., has been elected president of the Bank of Craigsville, Va., which has just re-opened after having been in the hands of a receiver.

The Hughes Memorial Hospital,

Recently completed at a cost of $400,000, was opened in Danville, Va., on June 10th. It was named in memory of the late John E. Hughes, of Danville, who left $250,000 in his will for the hospital. The building has four stories and is modern in every way. Upon opening of the new hospital, patients were transferred from the former General Hospital, which was then closed.

Dr. Guy Hinsdale,

Of Hot Springs, Va., has gone to his summer residence, Kennebunkport, Maine, where he will remain until September 15th. Dr. Hinsdale is American Representative in the International Society of Medical Hydrology for 1926.

Dr. P. A. Irving,

Farmville, Va., was recently knocked down by an automobile, but we are glad to announce that he suffered only minor injuries.

Dr. J. B. Harvie Waring,

Blanchester, Ohio, read a paper entitled "Modern Tonsillectomy Methods" at the meeting of the Ohio State Medical Association in Toledo, in May.

Dr. P. W. Miles,

Danville, Va., is taking a special course in pediatrics at Harvard Medical School, Boston. Upon his return home, in the late summer, he will limit his work to this specialty.

Married.

Dr. Harry Goldstein, Erie, Pa., of the class of '26, Medical College of Virginia, and Miss Dorothy Cohen, Richmond, June 2.

XUM

Dr. Charles W. Richardson,

Washington, D. C., who has just completed a term of service as a trustee of the American Medical Association, at the Dallas meeting was re-elected for another term of five years.

Dr. and Mrs. J. S. Horsley, Jr.,

Richmond, left early this month for Baltimore, where Dr. Horsley plans to spend a while observing the plastic work of Dr. John Staige Davis, one of the two men in the United States who does plastic surgery alone.

Dr. John Lee Grant,

For sometime at Midland, Va., has just returned to Virginia after an absence of about a year, and has located in Winchester, Va.

Dr. Israel Brown Praises Comrade.

There was recently unveiled at Arlington National Cemetery a bronze tablet bearing the names of eleven army chaplains killed in action or who died of wounds and of twelve others who died during the World War. One who died of wounds was Reverend Thomas M. Bulla, of Emporia and Norfolk.

Dr. Israel Brown, of Norfolk, has recently prepared a most interesting sketch of Mr. Bulla, from the time he first met him when he entered the service in August, 1917, to the time of his death. The Norfolk papers published the splendid tribute to this young man, who was beloved alike by officers and men on the French battle front.

Dr. and Mrs. E. Latane Flanagan,

Richmond, motored to Louisa, Va., the latter part of May, for a short visit to relatives.

Dr. W. B. Fuqua

Has returned to his home in Radford, Va., after a motor trip through Eastern Virginia.

A World Conference on Narcotic Education

Will be held in Philadelphia, July 5-10, with headquarters at the Bellevue-Stratford Hotel. Information with regard to this conference may be obtained from Advance Headquarters, Room 192-A House Office Bldg., Washington, D. C.

Antituberculosis Campaign in Massachusetts.

Reporting progress in the ten-year program for the control of tuberculosis in children begun in 1924, the Massachusetts Department of Public Health states that 10,000 white children between five and fifteen were examined during the first year at clinics held in forty-three cities and towns. Approximately 29 per cent of the children reacted to the tuberculin test, 28 per cent gave a history of exposure to human tuberculosis, 25 per cent of these being cases of immediate contact with the disease, and 15 per cent of the rural children gave a history of contact but did not react to the test. Among other defects discovered and treated were enlarged and diseased tonsils and adenoids in 31 per cent of the country and 26 per cent of the city children; poor posture in about 60 per cent of all the children, and valvular heart disease in 1.7 of both groups. Re-examination of some of these children during the present year indicates that through the co-operation of the local communities, physical defects are being corrected and underweight is already being lessened.

The U. S. Civil Service Commission,

Washington, D. C., announces open competitive examinations for Junior Medical Officer (Interne), applications to be rated as received until August 31; and for Dietitian, applications to be rated as received until December 30.

Full information and application blanks may be obtained from the Commission or from the secretary of the Board of U. S. Civil Service Examiners at the post-office or custom house in any city.

Dr. and Mrs. M. L. Anderson,

Richmond, motored to Lynchburg, early this month, to attend the graduation exercises at Randolph-Macon Woman's College, their daughter, Miss Anne Anderson, being a senior there this year.

Dr. Fred M. Hodges,

Richmond, was made secretary of the Section on Radiology of the American Medical Association, at the meeting in Dallas, Texas, recently.

The American Association of Genito-Urinary Surgeons,

At its annual meeting in May, elected Dr. James A. Gardner, Buffalo, N. Y., president, and Dr. William C. Quinby, Boston, secretary. It was decided to hold the next annual session at Atlantic City, N. J.

Dr. Stuart McGuire,

Richmond, Va., was one of the speakers at the meeting of the Sixth District Medical Society of North Carolina, at its meeting held at Wake Forest, May 11.

Dr. H. L. Burwell

Has returned to his home at Chase City, Va., after a visit to Roanoke, Va.

Dr. Brodnax Honored.

Students of the Medical College of Virginia, Richmond, honored Dr. John W. Brodnax, of this city, for many years a professor at the College, by dedicating this year's issue of "*The X-Ray*" to him, in behalf of his long and faithful services to the college. Dr. Brodnax has long been held in high esteem by the faculty and students of the College.

Independence Day

Is near at hand and now is the time to impress upon grown-ups and children alike the need of care in the use of fireworks in celebration of the Fourth of July. Last year's celebration resulted in 111 killed and 1,030 known injured—mostly children—as the result of the Fourth of July celebration. Many of these casualties were caused by the so-called harmless sparklers, other fireworks, bonfires, cap pistols, blank cartridges, etc. A marked reduction in the list of casualties is noted in some of the larger cities where restrictive legislation has been properly enforced.

Had a record been kept of all casualties resulting from the use of fireworks since 1776, it would undoubtedly be found that more persons have been killed and injured during celebrations commemorating our Independence Day than were killed and injured during the Revolutionary War.

New Publication by U. S. Public Health Service.

The United States Public Health Service, Washington, D. C., announces the issuance of a publication known as the "Venereal Disease Manual for Social and Corrective Agencies." This is especially designed for: Courts and Probation Officers, Social Workers, Nurses, Visiting Teachers, Jailers and Wardens, Policemen and Policewomen, Superintendents and Matrons of Homes for the Dependent, Delinquent and Defective Classes.

University of Virginia Hospital Report.

The Biennial Report of the University of Virginia Hospital, at Charlottesville, for the two years from July 1, 1923 to July 1, 1925, shows that for the first year there were 4,683 patients admitted to the Hospital and in the second year, 5,406. The daily average cost per In-patient was $3.50 the first year and $4.08 the second year. During this period the McIntire Building was opened. The top floor of this building is used for the residence of the internes, the lower floors being used for the Children's Department and the Obstetrical Department.

This is one of the two State-supported hospitals and, in the period covered by this report, patients were received from ninety-five of the one hundred counties of the State, in addition to a number from other states.

Dr. I. Keith Briggs

And some friends, of South Boston, Va., left early this month for a visit to Florida.

Dr. Loring Hammer

Has returned to his home at Luray, after a short stay in Richmond.

On Fishing Trip.

Drs. A. W. Terrell and R. M. Taliaferro, Lynchburg, Va., have gone to the Eastern Shore of Virginia, on a fishing trip.

Dr. and Mrs. E. H. Claud

Have returned to their home in Portsmouth, after a visit in Boydton, Va.

Dr. H. R. Farley,

Pulaski, Va., has been on a visit to his former home in Giles County, Va.

Dr. Clifton W. Henson,

Richmond, of the class of '26, Medical College of Virginia, is spending the month of June, assisting Dr. Walter D. Simmons, at Slab Fork, W. Va.

Wanted—

A graduate in medicine, with general hospital training, to serve as interne in Eye, Ear and Throat Hospital. Salary and maintenance. Apply to Dr. E. G. Gill, Roanoke, Va. (Adv.)

For Sale.

Electric Diagnostic Outfit, McIntosh Electric Head Light, E. S. I. Cautery Transformer, Air Compressor Apparatus, McCaskey

Physicians' and Surgeons' Register (has never been used and all cards are in it), Walker and DePuy Splints, and all kinds of surgical instruments. Address Mrs. W. W. Chaffin, Pulaski, Va.—(Adv.)

Obituary

Dr. William Edward Anderson,

Of Farmville, Va., a former vice-president of the Medical Society of Virginia, died May 10, having been in bad health for some time. Dr. Anderson was born in Prince George County, Va., in September, 1866, and received his early education at Randolph-Macon College. He graduated from the Medical College of Virginia in 1888 and joined the Medical Society of Virginia that year. He was an active member of this Society, having represented it in the House of Delegates of the American Medical Association for several terms. He practiced his profession in Farmville for twenty-five years and was for some time a surgeon of the Norfolk and Western Railway. His wife and several children survive him.

Dr. Robert Scott Spilman,

For some time a practicing physician in Norfolk, Va., but for the past few years Post Physician at Virginia Military Institute, Lexington, Va., died at his home in that place, May 22, aged 58 years. The burial was at Warrenton, Va., his native home. Dr. Spilman graduated from Virginia Military Institute in 1893 and from University and Bellevue Hospital Medical College, New York, in 1899. He joined the Medical Society of Virginia that year. Dr. Spilman saw service in the Spanish-American War and was also overseas in the World War. During his last service abroad, he was gassed and never had good, vigorous health afterward. He was unmarried but is survived by his sisters at Warrenton, Va.

Dr. Marshall Price Jones,

Of Churchville, Va., for thirty years a practicing physician of Augusta County, died in Staunton, Va., May 21, after a brief illness. Dr. Jones was born in Highland County, Va., sixty-two years ago, and studied medicine at the College of Physicians and Surgeons, Baltimore, from which he graduated in 1892. He had been a member of the Medical Society of Virginia since 1906. He is survived by his wife and a large family connection.

Dr. John E. Coles,

Of Alberene, Va., died suddenly, in California, about the middle of May. The interment was made near his home in Albemarle County, Va. Dr. Coles was a native of Albemarle County, and 65 years of age. He obtained his early education at local schools and received his diploma in medicine from the University of Virginia in 1882. Following this, he practiced his profession in Albemarle County until 1920, when he retired, since which time he had spent much time in travelling. He had been a member of the Medical Society of Virginia since 1883.

Dr. Benjamin W. Cohn,

Of Norfolk, Va., died in that city, November 4, 1925. He was 61 years of age and had graduated from the Medical College of Virginia, Richmond, in 1884. He was a member of the Medical Society of Virginia.

Dr. John Whitehead,

Prominent North Carolina physician, died suddenly at his home, Salisbury, N. C., April 15, death being due to heart disease. He was seventy years of age and was graduated in medicine from the University of Pennsylvania School of Medicine, Philadelphia, in 1880.

Dr. William Wade Morris,

For many years a physician and prominent figure in Henry County, Virginia, died at his home at Preston, May 13, aged 94 years. He was graduated in medicine from Jefferson Medical College, Philadelphia, in 1860, and saw active service with the Confederacy in the War between the States. Several children survive him.

Dr. Joseph H. Lawrence,

Pendleton, S. C., of the class of '90, Medical College of Virginia, was killed by the accidental discharge of his shot gun, when starting on a fishing and hunting trip, May 17. Dr. Pendleton was a native of Southampton County, Va., and was visiting a sister there at the time of his death.

Dr. Joseph H. Delaney,

Of the class of '97, University of Virginia, Department of Medicine, and for sometime of Bozeman, Montana, died at San Antonio, Texas, March 11, aged fifty-one years. Death was due to tuberculous meningitis.